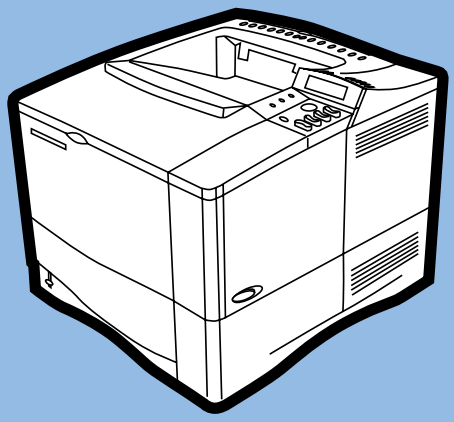

hp LaserJet 4100

invent

service manual

HP LaserJet 4100 Series Printer

Service Manual

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1 Printer description

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Printer features

Table 1. Printer features for the HP LaserJet 4100 series printers

Models	**HP LaserJet 4100 (C8049A):** • 25 pages per minute (ppm) for letter-size paper, and 24 ppm for A4-size paper • 16 megabytes (MB) random-access memory (RAM) • 600-sheets input capacity **HP LaserJet 4100N (C8050A):** Base unit plus the following: • 16 MB RAM (32 MB total) • 10/100BaseT card **HP LaserJet 4100TN (C8051A):** Base unit plus the following: • 16 MB RAM (32 MB total) • 10/100BaseT card • One 500-sheet feeder (1100-sheet input capacity) **HP LaserJet 4100DTN (C8052A):** Base unit plus the following: • 16 MB RAM (32 MB total) • 10/100BaseT card • One 500-sheet feeder (1100-sheet input capacity) • Duplex printing accessory
Accessories	• Stackable 500-sheet feeder with XY size capability • Duplex printing accessory • 75-sheet envelope feeder • 4, 8, 16, 32, 64, and 128 MB dual inline memory modules (DIMMs) • 2 and 4 MB flash DIMMs • LocalTalk/Universal Serial Bus (USB)/Serial and Token Ring EIO cards • Infrared adapter • Enhanced input/output (EIO) hard disk drive • HP Print to Mail (not available in all regions)
Speed	• 25 ppm for letter-size paper, and 24 ppm for A4-size paper • RIP ONCE (rasterized image processing) capability with 16 MB or hard-disk options for faster production • First page out = 12 seconds • 250 MHz RISC processor

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Table 1. Printer features for the HP LaserJet 4100 series printers (continued)

Resolution	The printer prints true 1200 dpi and supports the following: • HP ProRes 1200 at full engine speed (PCL6 and PS)—produces 1200-dpi printing for the best quality of graphic images • HP FastRes 1200 (PCL6 only)—produces emulated 1200-dpi print quality for fast, high-quality printing of business text and graphics • 600 dpi with PCL5e and PS • 300 dpi with PCL5e and HP PostScript™ Level 3 emulation (PS)
Typefaces/fonts	110 Scalable TrueType™ (80 built-in, 30 with HP FontSmart, all PCL and PS accessible)
Memory	Standard Memory: • HP LaserJet 4100: 16 MB synchronous dynamic random access memory (SDRAM) standard (installed on a DIMM) • HP LaserJet 4100N/4100TN/4100DTN: 32 MB SDRAM standard (installed on a DIMM) Optional Memory: • 4, 8, 16, 32, 64, and 128 MB SDRAM DIMM • Expandable memory (up to 256 MB) using three DIMM slots
Mass storage options	• 2 and 4 MB flash DIMMs • 2 gigabyte (GB) or larger EIO hard disk
Interface	• Bidirectional (IEEE-1284-compliant) parallel interface • Paper-handling connector (PHC) • 10/100Base-TX Fast Ethernet (4100N/4100TN/4100DTN)
Optional networking	• Enhanced input/output (EIO)—HP JetDirect EIO internal print server network cards • Token Ring (EIO) network cards • Fast Ethernet (10/100Base-TX single RJ-45 port) • HP JetDirect Connectivity card (EIO) for USB, Serial, LocalTalk
Expansion slots	• Three 100-pin DIMM slots • Two EIO slots

Table 1. Printer features for the HP LaserJet 4100 series printers (continued)

Paper trays	**100-sheet tray 1** • Standard and custom sizes: from 76 by 127 mm (3 by 5 inches) to 216 by 356 mm (8.5 by 14 inches) **500-sheet tray 2** • Letter: 216 by 279 mm (8.5 by 11 inches) • A4: 210 by 297 mm (8.3 by 11.7 inches) • Executive: 191 by 267 mm (7.3 by 10.5 inches) • Legal: 216 by 356 mm (8.5 by 14 inches) • B5 (JIS): 182 by 257 mm (7.2 by 10 inches) • A5: 148 by 210 mm (5.8 by 8.2 inches) • Custom sizes: from 148 by 210 mm (5.8 by 8.2 in) to 216 by 356 mm (8.5 by 14 in) **500-sheet tray 3 (HP LaserJet 4100TN/4100DTN)** • Letter: 216 by 279 mm (8.5 by 11 inches) • A4: 210 by 297 mm (8.3 by 11.7 inches) • Executive: 191 by 267 mm (7.3 by 10.5 inches) • Legal: 216 by 356 mm (8.5 by 14 inches) • B5 (JIS): 182 by 257 mm (7.2 by 10 inches) • A5: 148 by 210 mm (5.8 by 8.2 inches) • Custom sizes: from 148 by 210 mm (5.8 by 8.2 in) to 216 by 356 mm (8.5 by 14 in) **Optional 500-sheet tray** • Letter: 216 by 279 mm (8.5 by 11 inches) • A4: 210 by 297 mm (8.3 by 11.7 inches) • Executive: 191 by 267 mm (7.3 by 10.5 inches) • Legal: 216 by 356 mm (8.5 by 14 inches) • B5 (JIS): 182 by 257 mm (7.2 by 10 inches) • A5: 148 by 210 mm (5.8 by 8.2 inches) • Custom sizes: from 148 by 210 mm (5.8 by 8.2 in) to 216 by 356 mm (8.5 by 14 in)
Paper path	Straight-through paper path available.
Output capacity	• 250-sheet top output bin (with bin-full sensor) • 50-sheet rear output bin
Input capacity	• HP LaserJet 4100 and 4100N: hold 600 sheets of paper. • HP LaserJet 4100TN and 4100DTN: hold 1,100 sheets of paper. • Expandable to hold up to 1,600 sheets of paper with optional 500-sheet tray(s); also holds envelopes.
Media handling options	• Duplexer • Envelope feeder (up to 75 envelopes) • 500-sheet tray • HP Print to Mail (not available in all regions)
Media weights	See page 25 through page 27.

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Table 1. Printer features for the HP LaserJet 4100 series printers (continued)

HP genuine toner cartridge	• No-shake cartridge design. • HP UltraPrecise toner for crisp, sharp output. • Supplies status page—provides information about the toner gauge, page count, and paper sizes used in the printer.
Printer languages	• HP PCL6 • HP PCL5e • PostScript 3 emulation • Automatic language switching
Duty cycle	Up to 150,000 pages per month.
Expanded support capabilities	Embedded Web server provides remote access and status information.

Product compatibility matrix

Table 2. Product compatibility matrix

		HP LaserJet printer series:		
Product	**Part number**	**4000**	**4050**	**4100**
Envelope feeder	C4122A	●	●	
	C8053A	●	●	●
Duplex printing accessory (duplexer)	C4123A	●	●	
	C8054A	●	●	●
Toner cartridges				
6,000 pages	C4127A	●	●	
10,000 pages	C4127X	●	●	
6,000 pages	C8061A	●	●	●
10,000 pages	C8061X	●	●	●
Paper trays				
500-sheet paper feeder and tray	C4124A	●[1]	●[1]	●[2]
500-sheet paper feeder and tray	C8055A	●[1]	●[1]	●
500-sheet replacement tray	C4125A	●[1]	●[1]	●[2]
500-sheet replacement tray	C8056A	●[1]	●[1]	●
500-sheet standard replacement tray	C3122A	●[3]	●[3]	●[3]
250-sheet standard replacement tray	C4126A	●[1]	●[1]	

1. A5 size is detected as custom size.
2. A5 size is detected as custom size; larger custom sizes might be detected as A5 size.
3. Supports only letter, A4, and legal sizes.

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Table 2. Product compatibility matrix

		HP LaserJet printer series:		
Product	**Part number**	**4000**	**4050**	**4100**
Memory				
4 MB extended data out (EDO) DIMM	C4135A	●		
8 MB EDO DIMM	C4136A	●		
16 MB EDO DIMM	C4137A	●		
4 MB SDRAM DIMM	C4140A	●	●	●
8 MB SDRAM DIMM	C4141A	●	●	●
8 MB SDRAM DIMM	C7842A	●	●	●
16 MB SDRAM DIMM	C4142A	●	●	●
16 MB SDRAM DIMM	C7843A	●	●	●
24 MB SDRAM DIMM	C7844A	●	●	●
32 MB SDRAM DIMM	C4143A	●	●	●
32 MB SDRAM DIMM	C7845A	●	●	●
64 MB SDRAM DIMM	C3913A	●	●	●
64 MB SDRAM DIMM	C7846A	●	●	●
128 MB SDRAM DIMM	C9121A			●
2 MB flash DIMM	C4286A	●	●	●
4 MB flash DIMM	C4287A	●	●	●
Font DIMMs				
Traditional Chinese font DIMM (8 MB Asian read-only memory [ROM])	C4292A	●	●	●
Simplified Chinese font DIMM (8 MB Asian ROM)	C4293A	●	●	●
Korean font DIMM (8 MB Asian ROM)	D4838A	●	●	●
Jet Direct EIO cards				
Ethernet RJ-45 only	J3110A	●	●	●
Ethernet RJ-45 and BNC, LocalTalk	J3111A	●	●	●
Token Ring	J4167A	●	●	●
10/100Base-TX	J4169A	●	●	●
USB, LocalTalk, and Serial	J4135A	●	●	●
Fast infrared receiver (FIR) pod	C4103A		●	●
EIO hard disk	C2985B	●	●	●
Preventive maintenance kits, user installable (consumable)				
110 V kit	C7851A	●	●	
220 V kit	C7852A	●	●	
110 V kit	C8057A			●
220 V kit	C8058A			●

Model and serial numbers

The model number and printer serial number are listed on an identification label located under the top cover on the right side of the printer. The model number is alphanumeric, such as C8049A for the HP LaserJet 4100 printer.

The serial number contains information about the country of origin, the revision level, the production code, and production number of the printer. An example of a serial number is USBB123456.

The label also contains power rating and regulatory information as shown in figure 1.

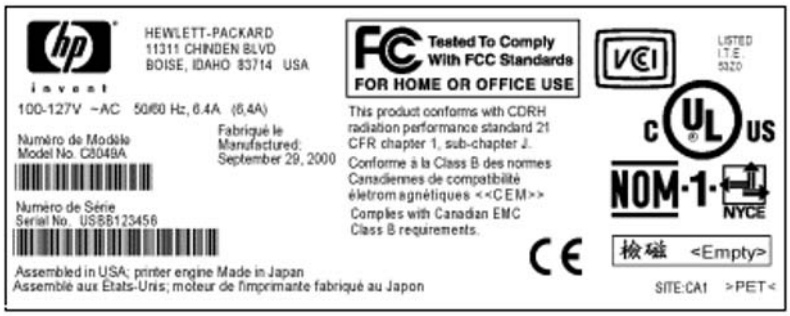
HEWLETT-PACKARD
11311 CHINDEN BLVD
BOISE, IDAHO 83714 USA
invent
100-127V ~AC 50/60 Hz, 6.4A (6.4A)
Numéro de Modèle
Model No. C8049A
Fabriqué le
Manufactured:
September 29, 2000
Numéro de Série
Serial No. USBB123456
Assembled in USA; printer engine Made in Japan
Assemblé aux États-Unis; moteur de l'imprimante fabriqué au Japon
Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE
This product conforms with CDRH radiation performance standard 21 CFR chapter 1, sub-chapter J.
Conforme à la Class B des normes Canadiennes de compatibilité életromagnétiques <<CEM>>
Complies with Canadian EMC Class B requirements.
LISTED
I.T.E.
c UL us
NOM-1
NYCE
<Empty>
SITE:CA1 >PET<

Figure 1. **Sample label**

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Site requirements

The following environmental specifications must be maintained to ensure the correct operation of the printer. Consider the following points before installing the printer:

- Install in a well-ventilated, dust-free area.
- Install on a hard, flat, continuous surface, with all four printer feet level. Do not install on carpet or other soft surfaces.
- Ensure adequate power is supplied. Printer power requirements are listed in table 3. Uninterruptable power supplies (UPSs) are not recommended.
- Install where temperature and humidity are stable, away from water sources, humidifiers, air conditioners, refrigerators, or other major appliances. See table 4 for temperature and humidity ranges.
- Install away from direct sunlight, open flames, or ammonia fumes. If the printer is placed near a window, make sure the window has a curtain or blind to block direct sunlight.
- Install with enough space around the printer for access and ventilation.
- Install away from the direct flow of exhaust from air ventilation systems.

Table 3. Electrical specifications for the HP LaserJet 4100 series printers

Volts	Frequency	Circuit Capacity	Watts (W) (typical)
100-127 VAC±10%	50/60 Hz ± 3 Hz	Minimum recommended = 10 amps	printing = 450 W standby = 19 W PowerSave on = 18 W (EPA ENERGY STAR®)
220-240 VAC±10%	50/60 Hz ± 3 Hz	Minimum recommended = 5 amps	printing = 450 W standby = 19 W PowerSave on = 18 W (EPA ENERGY STAR®)

Installation requirements

Install the printer with enough space around it to open trays and bins, install toner, and perform maintenance. If the duplexer is installed, the printer needs 101 mm (4 inches) of ventilation space on the left side (fan side) and rear of the printer.

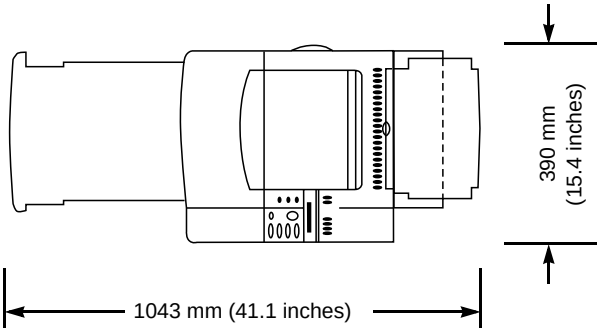

Figure 2. **Top view, HP LaserJet 4100/4100N/4100TN/4100DTN printer with trays and rear output bin open**

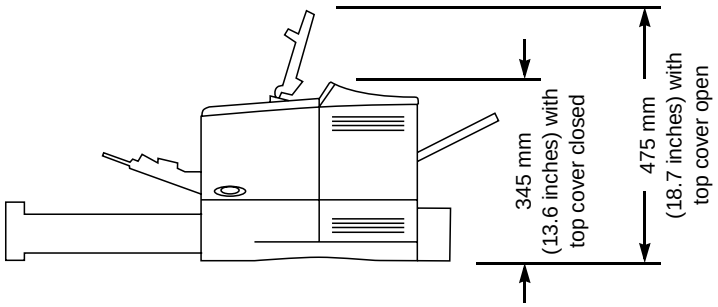

Figure 3. **Side view, HP LaserJet 4100/4100N printer**

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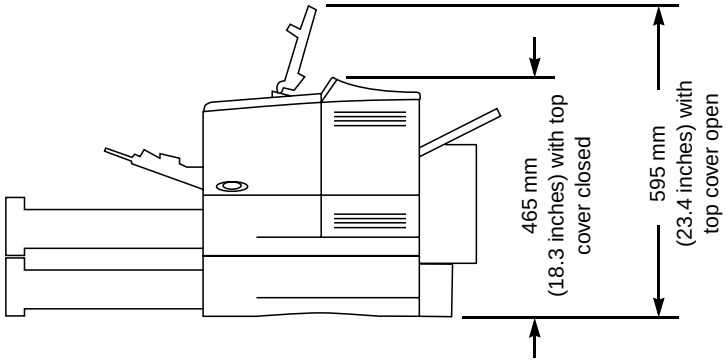

Figure 4. **Side view, HP LaserJet 4100TN/4100DTN printer**

Printer weight (without toner cartridge)

- HP LaserJet 4100/4100N printers: 18 kg (39 lb)
- HP LaserJet 4100TN printer: 25 kg (55 lb)
- HP LaserJet 4100DTN printer: 28 kg (62 lb)

Environmental requirements

Table 4. Printer and toner cartridge environmental conditions

Item	Operating	Storage
Temperature	10° to 32° C (50 to 91° F)	Toner cartridge: 0° to 35°C (32 to 95° F) Printer: -20 to 60°C (-4° to 140° F)
Relative humidity	20 to 80 percent relative humidity (RH) (with no condensation)	10 to 95 percent RH

Table 5. Operating sound power or pressure (Per ISO 9296)

Sound power level	L_{WAd}= 6.6 Bels (A) printing, L_{WAd}= 4.1 Bels (A) idle
Operating position	L_{pAm}= 58 dB (A) printing, L_{pAm}= 32 dB (A) idle
Bystander position	L_{pAm}= 52 dB (A) printing, L_{pAm}= 26 dB (A) idle

Note Testing per International Standards Organization (ISO) 9296/7779

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Print media specifications

The following tables show print media specifications for the HP LaserJet 4100 series printer.

Table 6. Print media specifications, tray 1

Supported media	Dimensions[1]	Weight	Capacity[2]
Minimum size (custom[3])	76 by 127 mm (3 by 5 inches)	60 to 199 g/m^2 (16 to 53 lb)	100 sheets of 75 g/m^2 (20 lb) paper
Maximum size (custom[3])	216 by 356 mm (8.5 by 14 inches)		
Transparencies	Same as minimum and maximum paper sizes listed above	Thickness: 0.10 to 0.11 mm (0.0039 to 0.0043 inch)	50 transparencies
Labels		Thickness: 0.13 to 0.18 mm (0.005 to 0.007 inch)	50 labels
Envelopes		75 to 105 g/m^2 (20 to 28 lb)	10 envelopes

1. The printer supports a wide range of print media sizes. Check the printer software for supported sizes. To print custom-size media, see the user guide.

2. Capacity can vary depending on media weight and thickness, and environmental conditions.

3. Custom media must be fed short-edge first (portrait).

Table 7. Print media specifications, trays 2, 3, and 4

Supported media	Dimensions[1]	Weight	Capacity[2]
Letter	216 by 279 mm (8.5 by 11 inches)	60 to 105 g/m^2 (16 to 28 lb)	500 sheets of 75 g/m^2 (20 lb) paper or 50 transparencies
A4	210 by 297 mm (8.3 by 11.7 inches)		
Executive	191 by 267 mm (7.3 by 10.5 inches)		
Executive (JIS) (custom[3])	216 by 330 mm (8.5 by 13 inches)		
16K (custom[3])	197 by 273 mm (7.75 by 10.75 inches)		
Legal	216 by 356 mm (8.5 by 14 inches)		
B5 (ISO) (custom[3])	176 by 250 mm (6.9 by 9.9 inches)		
B5 (JIS)	182 by 257 mm (7.2 by 10 inches)		
A5	148 by 210 mm (5.8 by 8.2 inches)		
Custom[3]	148 by 210 mm to 216 by 356 mm (5.8 by 8.2 inches to 8.5 by 14 inches)		

1. The printer supports a wide range of print media sizes. Check the printer software for supported sizes. To print custom-size media, see the user guide.

2. Capacity can vary depending on media weight and thickness, and environmental conditions.

3. Custom media must be fed short-edge first (portrait).

Table 8. Print media specifications, optional envelope feeder

Supported envelope	Dimensions	Weight	Capacity[1]
Monarch (#7 3/4)	98.4 by 190.5 mm (3.88 by 7.50 inches)	75 to 105 g/m2 (20 to 28 lb)	75 envelopes
Commercial 10 (#10)	104.9 by 241.3 mm (4.13 by 9.5 inches)		
DL ISO	110 by 220 mm (4.33 by 8.66 inches)		
C5 ISO	162 by 229 mm (6.38 by 9.02 inches)		
B5 ISO	176 by 250 mm (6.93 by 9.84 inches)		

1. Capacity can vary depending on media weight and thickness, and environmental conditions.

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Table 9. Print media specifications, optional duplexer

Supported media	Dimensions	Weight
Letter	216 by 279 mm (8.5 by 11 inches)	60 to 105 g/m2 (16 to 28 lb)
A4	210 by 297 mm (8.3 by 11.7 inches)	
Executive	184 by 267 mm (7.3 by 10.5 inches)	
Legal	216 by 356 mm (8.5 by 14 inches)	
B5 (JIS)	182 by 257 mm (7.2 by 10 inches)	

Supported types of print media

The printer supports the following types of print media:

- plain
- letterhead
- prepunched
- bond
- color
- rough
- preprinted
- transparency (see page 32)
- labels (see page 31)
- recycled
- card stock

Note Transparencies and labels must be specified for use in laser printers.

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Types of print media to avoid

The following characteristics can affect the performance of the HP LaserJet printer unless the paper or other print media used is specifically designed to work with the HP LaserJet printer.

- Print media that is very rough, highly textured, or heavily embossed.
- Print media with multipart forms.
- Print media that offsets materials or discolors.
- Print media that is damaged, curled, wrinkled, or irregularly shaped.
- Paper that is extremely shiny or glossy.
- Paper, labels, envelopes, or transparencies that produce undesirable emissions or melt when exposed to a fusing temperature between 175° to 230° C (347° to 446° F) for 0.1 second.
- Media coatings, dyes, or inks that produce undesirable emissions or melt when exposed to a fusing temperature between 175° to 230° C (347° to 446° F) for 0.1 second.
- Envelopes that have an open flap with the adhesive exposed so that closing the flap seals the envelope.
- Envelopes with clasps, snaps, tie strings, windows, or synthetic materials. These materials can severely damage the printer.
- Envelopes that are not square, straight, or constructed correctly (see "Envelope construction" on page 33).
- Envelopes with a basis weight less than 60 g/m^2 (16 lb) or greater than 105 g/m^2 (28 lb).
- Envelopes with baggy construction or folds that are not sharply creased.

Note Some media types might not work in the printer because of differences in manufacturer specifications or environmental conditions.

Weight equivalence table

The following table shows equivalent weights for different grades of paper. A boldface type value indicates a commonly available standard weight for that grade. Shaded boxes indicate a commonly available standard weight for that grade.

Note Text and book grades marked with an asterisk (*) actually calculate to 51, 61, 71, and 81 but are rounded to standard book or text weights of 50, 60, 70, and 80.

Table 10. Weight equivalence table

Bond weight (17 by 22 inches)	Book/text weight (25 by 38 inches)	Cover weight (20 by 26 inches)	Bristol weight (22.5 by 28.5 inches)	Index weight (25.5 by 30.5 inches)	Tag weight (24 by 36 inches)	Metric weight
16#	41#	22#	27#	33#	37#	60 g/m^2
17#	43#	24#	29#	35#	39#	64 g/m^2
20#	50# *	28#	34#	42#	46#	75 g/m^2
21#	54#	30#	36#	44#	49#	80 g/m^2
24#	60# *	33#	41#	50#	55#	90 g/m^2
27#	68#	37#	45#	55#	61#	100 g/m^2
28#	70# *	39#	49#	58#	65#	105 g/m^2
29#	74#	41#	50#	61#	68#	110 g/m^2
32#	80# *	44#	55#	67#	74#	120 g/m^2
36#	90#	50#	62#	75#	83#	135 g/m^2
39#	100#	55#	67#	82#	91#	148 g/m^2
40#	101#	55#	68#	83#	92#	150 g/m^2
43#	110#	60#	74#	90#	100#	163 g/m^2
45#	115#	63#	77#	94#	104#	170 g/m^2
47#	119#	65#	80#	97#	108#	176 g/m^2
51#	128#	70#	86#	105#	117#	190 g/m^2
53#	134#	74#	90#	110#	122#	199 g/m^2
54#	137#	75#	93#	113#	125#	203 g/m^2
58#	146#	80#	98#	120#	133#	216 g/m^2
65#	165#	90#	111#	135#	150#	244 g/m^2
66#	169#	92#	114#	138#	154#	250 g/m^2
67#	171#	94#	115#	140#	155#	253 g/m^2
70#	178#	98#	120#	146#	162#	264 g/m^2
72#	183#	100#	123#	150#	166#	271 g/m^2

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Adhesive labels

When printing on labels, use of tray 1 is recommended. Labels are multiple-layer media typically consisting of a face sheet (the printable surface), pressure-sensitive adhesive, and a liner (a carrier sheet coated with a release agent). Labels used in the HP LaserJet printer must be specifically designed for laser printers. If labels other than those compatible with laser printers are used, there is a significant risk of labels peeling or of adhesive contamination that can severely damage the printer. All materials in laser label stock must be compatible with the heat and pressure of the fusing process.

The table below summarizes the adhesive label specifications that provide the best performance.

Table 11. Adhesive labels specifications

Property	Specifications
Adhesive	Must not be on any external surfaces of the label before, during, or after printing. Label construction, adhesive release strength, and die-cutting must not allow labels to peel off during printing.
Caliper (thickness)	Must not exceed 0.23 mm (9.0 mils).
Fusing compatibility	All inks, adhesives, and other materials used in the label construction must be compatible with the heat and pressure of the fusing process. Materials must not scorch, melt, ignite, offset materials, or release undesirable emissions when heated to a temperature between 175° to 230° C (347° to 446° F) for 0.1 second.
Packaging	Adhesive labels should be packaged in moisture-proof wrap to preserve properties.
Shelf life	One year maximum, stored at 23° C (73° F) and 50 percent RH.

Overhead transparencies

When printing transparencies, use of tray 1 is recommended. Overhead transparency film must be designed specifically for use with laser printers. Photocopy transparency film might not be compatible with laser printers because of higher temperature and stiffness requirements.

Overhead transparency film is very smooth and must have a topcoat to provide the proper electrical and toner adhesion properties. A transparency that is made of poor materials or that is too thin can easily melt in the fuser and damage the printer.

Overhead transparency materials must be compatible with the heat and pressure of the fusing process.

The table below summarizes the overhead transparency specifications that provide the best performance.

Table 12. Overhead transparencies specifications

Property	Specifications
Caliper (thickness)	0.10 mm to 0.11 mm (4.0 mils to 4.4 mils).
Electrical surface resistivity	2.0 to 15 by 10^{10} ohms/square.
Fusing compatibility	Overhead transparency materials must be compatible with the heat and pressure of the fusing process. Materials must not discolor, melt, offset materials, or release undesirable emissions when heated to a temperature between 175° to 230° C (347° to 446° F) for 0.1 second.

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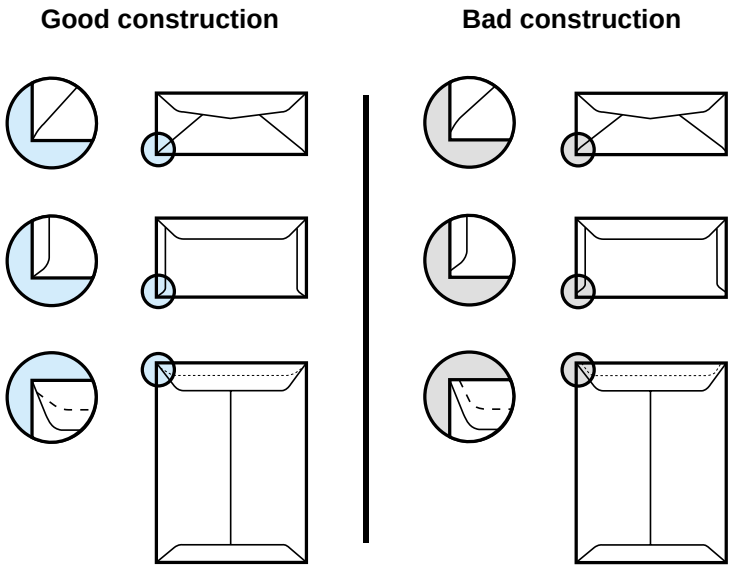
Envelopes

Envelope construction

Envelopes can only be printed from tray 1 or from the optional envelope feeder. Because of their construction, some envelopes will not feed through the printer dependably. Observe the following guidelines when purchasing and using envelopes:

- Make sure the envelope's leading edge, which enters the printer first, is straight, with a sharp, well-creased fold that has no more than two thicknesses of paper. Envelopes that exceed 105 g/m^2 (28 lb) basis weight can cause jamming.
- Avoid using flimsy envelopes with thick or curved leading edges; they will not feed reliably.
- Envelopes should lie flat and should not be wrinkled, nicked, or otherwise damaged.
- Avoid envelopes with baggy construction; they might wrinkle while going through the printer's fuser assembly.
- Make sure that the adhesive labels used on envelopes will not scorch, melt, offset, or release undesirable emissions when heated to a temperature between 175° to 230° C (347° to 446° F) for 0.1 second.
- Avoid using envelopes with encapsulated adhesives that rely on pressure rather than moistening to seal.
- Do not use envelopes with clasps, snaps, tie strings, transparent windows, holes, perforations, or cutouts.
- Do not use envelopes that have any adhesive surfaces exposed to the printer.
- Woven or smooth finishes are recommended to ensure good toner adhesion on envelopes.

Many envelopes will feed through the HP LaserJet printer without problems. However, some envelope constructions (as shown in the figure below) will not feed reliably. Problems can occur when the envelopes are folded more tightly than normal, causing a thick leading edge near a corner. Folding inconsistencies at the manufacturer can cause some envelopes to feed well and others to jam.



Envelope specifications

The table below summarizes the envelope specifications that provide the best performance.

Table 13. Envelope specifications

Property	Specifications
Basis weight	64 g/m^2 to 105 g/m^2 (17 lb to 28 lb) typical. See the user guide for specific printer and input limits.
Caliper (thickness)	0.09 mm to 0.14 mm (3.6 mil to 5.5 mil) typical single-layer thickness.
Surface roughness	100 to 200 Sheffield.
Fusing compatibility	All inks, adhesives, and other materials used in the envelope construction must be compatible with the heat and pressure of the fusing process. Materials must not scorch, melt, ignite, offset materials, or release undesirable emissions when heated to a temperature between 175° to 230° C (347° to 446° F) for 0.1 second.
Dimensional accuracy and construction quality	• Envelopes must be folded within ±1.0 mm (±0.04 inch) of nominal size with no more than two thickness of paper anywhere along the leading edge. • All folds must be sharply creased and construction must be tight (not baggy) to avoid wrinkling. • Envelopes must not be stuck together from excess seam adhesive (blocking). • The flap must be flat within 1.5 mm (0.059 in) over the width where adhesive is applied.
Curl	Envelopes must lie flat, with no more than 6 mm (0.25 inch) curl across the entire surface.
Adhesive flap curl	Envelope flap should be flat, with 1.5 mm (0.059 inch) over the width where adhesive is applied.
Moisture content	4 percent to 6 percent by weight.
Grain	Different envelope constructions might require different grain orientations for best performance, which is left to the discretion of the manufacturer.
Packaging	Envelopes should be contained in a protective box to prevent edge damage and maintain flatness.

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Card stock and heavy paper

Many types of card stock and paper can be printed from tray 1, including index cards and postcards.

For optimum printer performance, do not use paper heavier than 199 g/m^2 (53 lb) in tray 1 or 105 g/m^2 (28 lb) in other trays. Paper that is too heavy might cause misfeeds, stacking problems, jams, poor toner fusing, poor print quality, or excessive mechanical wear.

Note Before loading card stock, make sure it is regular in shape and not damaged or wrinkled. Also, make sure the cards are not stuck together.

The table below summarizes the paper specifications that provide the best performance.

Table 14. Paper specifications

Property	Specifications
Basis weight	64 g/m^2 to 105 g/m^2 (17 lb to 28 lb) typical. See the user guide for specific printer and input limits.
Caliper (thickness)	0.09 mm to 0.17 mm (3.5 mil to 6.5 mil) typical. See the user guide for specific printer and input limits.
Minimum stiffness	1.2 minimum (Taber) machine direction; 0.8 minimum (Taber) cross direction.
Grain	Portrait feeding: short or long grain up to 36 lb. Landscape feeding: long grain.
Electrical surface resistivity	10^9 to 10^{13} ohms/square.
Electrical volume resistivity	10^9 to 10^{14} ohms - cm.
Surface roughness	100 to 190 Sheffield optimal; 30 to 350 Sheffield extended (fusing or feeding performance can be degraded at outer ranges).
Fusing compatibility	Must not scorch, melt, ignite, offset materials, or release undesirable emissions when heated to a temperature between 175° to 230° C (347° to 446° F) for 0.1 second.
Furnish (composition)	One hundred percent chemical pulp and/or cotton content; recycled paper with up to 5 percent groundwood can be used.
Dimensional accuracy	Cut sheet within ±0.80 mm (±0.03 inch) of nominal.
Cut edge quality	Cuts must be smooth and clean with no fray or edge roll.
Curl	Must lie flat within 5 mm (0.2 inch).
Moisture content	4 percent to 6 percent by weight.
Packaging	Card stock and heavy paper should be packaged in a moisture-proof ream wrap.
Wax pick	12 minimum (Dennison).

Safety information

Toner safety

Handling and storage

WARNING! Keep toner cartridges and toner particles away from excessive heat, sparks, and open flames.

If toner is spilled, avoid breathing in toner particles. Inhalation of toner particles can cause respiratory tract irritation. Vacuum or sweep the material into a bag or other sealed container. If a vacuum is used, the motor must be rated as dust-tight.

Dispose of waste toner in accordance with local requirements. Do not discharge toner particles in drains.

First aid measures

- **Ingestion**. If toner is ingested, drink several glasses of water. Get medical attention if discomfort persists.
- **Inhalation**. If toner particles are inhaled, move to fresh air immediately. If symptoms occur (such as coughing, dizziness, or difficulty breathing), consult a physician.
- **Eye contact**. If toner comes in contact with the eyes, immediately flush with plenty of water for at least 15 minutes. If irritation persists, consult a physician.
- **Skin contact**. If toner spills on skin, remove as much toner as possible with a dry tissue, and then wash with cold water.

Clothing contact

Note Toner can stain clothing. Hot water or heat (from a clothes dryer) can cause toner to melt and permanently fuse into clothing.

Clothing is best cleaned by removing as much toner as possible with a dry tissue, and then washing with cold water. Air-dry clothing.

Additional information

The Toner Cartridge/Drum Material Safety Data Sheet (MSDS) can be obtained by contacting HP at the following website:
http://www.ljsupplies.com

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Laser safety

Do not open the laser scanner assembly. Avoid direct exposure to the laser beams.

WARNING! Using controls, making adjustments, bypassing safety switches, or performing procedures other than those specified in this service manual can result in exposure to hazardous radiation.

Regulatory information

For regulatory information and requirements, please see the user guide.

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2 Service approach

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Service approach

Repair of the printer normally begins with use of the printer's internal diagnostics in conjunction with the troubleshooting procedures in chapter 7. When a faulty part is located, repair is generally accomplished by assembly-level replacement of field-replaceable units (FRUs). Some mechanical assemblies might be repaired at the subassembly level. Hewlett-Packard does not support replacement of components on printed circuit boards.

Parts and supplies

Ordering information

Chapter 8 of this manual contains FRU and accessory part numbers. Replacement parts can be ordered from the HP Customer Services and Support Organization.

Use only accessories specifically designed for this printer. Order accessories from an authorized service or support provider. (See page 42.)

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Printer documentation

The table below lists part numbers to use when ordering documentation. For information about ordering, see page 42.

Note Some of the materials listed in table 15 are also available online at http://www.hp.com.

Table 15. Printer documentation

Item	Description or use	Part number
HP LaserJet Printer Family Print Media Guide	A guide to using paper and other print media with HP LaserJet printers	5963-7863 (English only)
PCL 5/PJL Technical Reference Documentation Package	A guide to using printer commands with HP LaserJet printers	5021-0330 (English only)
HP LaserJet Basics CD-ROM	A guide to using HP LaserJet printer hardware	H8789A (English only); online at: http://software.hp.com
User Getting Started Guide, HP LaserJet 4100 Series Printers	An additional copy of the user getting started guide	C8049-90903 (English only)
HP LaserJet 4100 Series Printers User Documentation CD-ROM	An additional copy of the user documentation CD-ROM	C8049-60104 (English only)
HP LaserJet 4100 Series Printers Software Technical Reference	A guide to the printer software	C8049-90921 (English only)
Service and Support CD-ROM for the HP LaserJet 4100 Series Printers	An interactive training CD-ROM for printer service representatives and customer care specialists	C8049-60116 (English only)
HP LaserJet 4100 Series Printers Service Manual	A service manual for the 4100 printer series.	C8049-90920 (English only)
HP LaserJet 4100 Series Printers Training Kit	Includes service manual and service and support CD-ROM	C8049-67901 (English only)

HP direct ordering for genuine HP parts

Customer Services and Support Organization (CSSO):

- (1) (800) 227-8164 (U.S. only)
- (49 7031) 142253 (Europe only)
- See chapter 8 for additional information.

Exchange program

HP offers remanufactured assemblies for some parts. These are identified in chapter 8 and can be ordered through CSSO.

Consumables

Paper and toner cartridges can be ordered directly from Hewlett-Packard. See chapter 8 for ordering information.

World Wide Web

Printer drivers, updated HP printer software, and product and support information can be obtained from the following URL:
in the U.S., http://www.hp.com/support/lj4100

Printer drivers can be obtained from the following sites:

in China, ftp://www.hp.com.cn/support/lj4100
in Japan, ftp://www.jpn.hp.com/support/lj4100
in Korea, http://www.hp.co.kr/support/lj4100
in Taiwan, http://www.hp.com.tw/support/lj4100
or the local driver website, http://www.dds.com.tw

HP service parts information compact disc

This powerful, CD-ROM-based parts information tool is designed to give users fast, easy access to parts information and recommended stocking lists for a wide range of HP products. To subscribe to this quarterly service in the U.S. or Canada, call (1) (800) 336-5987. In Asia Pacific, call (65) 740-4484. Parts identification and pricing information can also be found on the World Wide Web at: http://www.hp.com/go/partsinfo

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HP support assistant compact disc

This support tool offers a comprehensive online information system designed to provide technical and product information about Hewlett-Packard products. To subscribe to this quarterly service in the U.S. or Canada, call (1) (800) 457-1762. In Hong Kong, Indonesia, Malaysia, or Singapore, call Mentor Media at (65) 740-4477.

Customer care reseller sales and service support center

The Customer Care Reseller Sales and Service Support Center is available to assist resellers and service technicians. To reach this support center, call (1) (800) 544-9976.

HP authorized resellers and support

To locate authorized HP resellers and support, call
(1) (800) 243-9816 in the U.S. or (1) (800) 387-3867 in Canada.

HP service agreements

Call (1) (800) 743-8305 in the U.S. or (1) (800) 268-1221 in Canada.

Other areas

Outside of North America and Europe, contact the local HP sales office for assistance in obtaining technical support for resellers and service technicians.

Toner cartridge information

The toner cartridge is designed to simplify replacement of the major “consumable” parts. The toner cartridge contains the printing mechanism and a supply of toner.

At five percent page coverage, a toner cartridge will print approximately 6,000 or 10,000 pages, depending on the toner cartridge model installed. A toner cartridge might print fewer pages if routinely printing with dense ink coverage, or more pages when routinely printing pages with less ink coverage, such as short memos. If EconoMode or small media is always used, however, the toner supply could outlast the mechanical parts in the toner cartridge.

Note For best results, always use a toner cartridge before the expiration date stamped on the toner cartridge box.

Refilled toner cartridges

While Hewlett-Packard does not prohibit the use of refilled toner cartridges during the warranty period or while the printer is under a maintenance contract, it is not recommended for the following reasons:

- Repairs resulting from the use of refilled toner cartridges are not covered under Hewlett-Packard warranty or maintenance contracts.
- Hewlett-Packard has no control or process to ensure that a refilled toner cartridge functions at the high level of reliability of a new HP LaserJet toner cartridge. Hewlett-Packard also cannot predict the long-term reliability effect on the printer from using different toner formulations found in refilled cartridges.
- The print quality of HP LaserJet toner cartridges influences the customer’s perception of the printer. Hewlett-Packard has no control over the actual print quality of a refilled toner cartridge.

Recycling toner cartridges

To reduce waste, Hewlett-Packard offers a recycling program for used toner cartridges. Cartridge components that do not wear out are recycled. Plastics and other materials are recycled.

Hewlett-Packard pays the shipping costs from the user to the recycling plant. For each cartridge returned, Hewlett-Packard donates one U.S. dollar to be shared by the Nature Conservancy and the National Wildlife Federation. To join this recycling effort, follow the instructions inside the toner cartridge box.

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Warranty statement

The warranty for this product gives the customer specific legal rights. There might also be other rights that vary from area to area.

Printer warranty

Hewlett-Packard warrants the HP LaserJet 4100 series printer for one year. For detailed information about the printer warranty, see the limited warranty statement in the user guide.

Limited warranty for toner cartridge life

Note The warranty below applies to the toner cartridge that came with this printer. This warranty supersedes all previous warranties (7/19/96).

The HP toner cartridge is warranted to be free from defects in materials and workmanship for the life of the cartridge until the HP toner is depleted. The HP toner is depleted when the printer indicates a toner-low message. Hewlett-Packard will, at its option, either replace products that prove to be defective or refund the purchase price.

The warranty does not cover toner cartridges that have been refilled, or are emptied, abused, misused, or tampered with in any way. This limited warranty gives the customer specific legal rights. The customer might have other rights which vary from state to state, province to province, and country to country.

To the extent allowed by applicable law, in no event shall Hewlett-Packard Company be liable for any incidental, consequential, special, indirect, punitive, or exemplary damages or lost profits from any break of this warranty or otherwise.

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3 Printer operation

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Using the control panel

Control panel layout

The printer control panel consists of a two-line display and lights and keys as shown below:

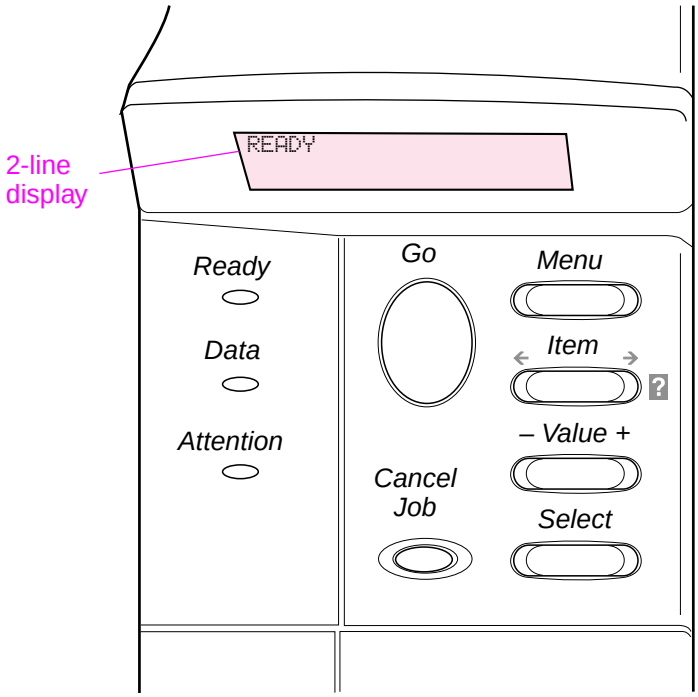

Figure 5. **Control panel layout**

Control panel lights

Table 16. Control panel lights

Light	Indication
Ready	The printer is ready to print.
Data	The printer is processing information.
Attention	Action is required. See the control panel display.

Control panel keys

Table 17. Control panel keys

Key	Function
GO	• Places the printer either online or offline. • Prints any data in the printer's buffer. • Allows the printer to resume printing after being offline. Clears most printer messages and places the printer online. • Allows the printer to continue printing with an error message such as `TRAY X LOAD [TYPE] [SIZE]` or `UNEXPECTED PAPER SIZE`. • Confirms a manual feed request if tray 1 is loaded and `TRAY 1 MODE=CASSETTE` has been set from the paper-handling menu on the printer control panel. • Overrides a manual feed request from tray 1 by selecting paper from the next available tray. • Exits the control panel menus. (To save a selected control panel setting, first press SELECT.)
CANCEL JOB	Cancels the print job that the printer is processing. The time and pages it takes to cancel depends on the size of the print job and the number of pages in the buffer. (Press it only once.)
MENU	Cycles through the control panel menus. Press the right end of the button to move forward or the left end of the button to move backward.
ITEM	Cycles through the selected menu's items. Press the right end of the button to move forward or the left end of the button to move backward.
– VALUE +	Cycles through the selected menu item's values. Press + to move forward or – to move backward.
SELECT	• Saves the selected value for that item. An asterisk (*) appears next to the selection to indicate that it is the new default. Default settings remain when the printer is switched off or reset. • Prints any information pages shown in the control panel.
?	Provides instructions for resolving most printer errors. Certain control panel error messages alternate with instructions about gaining access to the online help system. Press the right end of the ITEM button to scroll through help messages.

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Settings and defaults

The printer makes most printing decisions based on either temporary settings or permanent defaults.

Note Settings sent from software applications override printer defaults.

Table 18. Settings and defaults

Setting or default	Explanation
Temporary setting	A value set for the current print job by the software application. For example, a request from the software to print three copies instead of the control panel default value of one copy is a temporary setting. The printer continues to use the temporary setting until it receives another software request or until it is reset.
Control panel default	A value set at the control panel when you select a menu item. An asterisk appears, indicating the default setting. The printer retains this default when it is turned off.
Factory default	The value set for each menu item at the factory. Factory defaults are listed in the item column in the menu tables starting on page 52.

Setting the display language

1. Press and hold SELECT while turning on the printer. Hold SELECT until `SELECT LANGUAGE` appears on the control panel display.
2. Release SELECT.
3. When `LANGUAGE=ENGLISH` appears on the display, press – VALUE + until the language you want appears.
4. Press SELECT to save your choice.
   An asterisk (*) will appear beside the selected language.
5. Press GO to exit the menu.

Control panel menus

Press MENU for access to all control panel menus. When additional trays or other accessories are installed in the printer, new menu items might automatically appear.

Changing a control panel setting

1. Press MENU until the menu you want appears on the control panel display.
2. Press ITEM until the item you want appears.
3. Press – VALUE + until the setting you want appears.
4. Press SELECT to save the selection.
   An asterisk (*) appears next to the selection in the display, indicating that it is now the default.
5. Press GO to exit the menu.

Note

Settings in the printer driver and software application override control panel settings. Software application settings override printer driver settings.

If you cannot get to a menu or item, it is either not an option for the printer, or the customer's network administrator has locked the function (the control panel reads ACCESS DENIED MENUS LOCKED). See the customer's network administrator.

Printing a control panel menu map

To see the current settings for all of the menus and menu items available on the control panel, print a control panel menu map.

1. Press MENU until INFORMATION MENU appears on the control panel display.
2. Press ITEM until PRINT MENU MAP appears.
3. Press SELECT to print the menu map.

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Quick copy jobs menu

This menu provides a list of the quick copy jobs stored on the printer. The user can print or delete these jobs from the control panel.

Note This menu appears only if you have an optional hard-disk accessory or 32 MB of memory installed and quick copy jobs are stored on it.

Table 19. Quick copy jobs menu

Item	Value	Explanation
[USERNAME] [JOBNAME]		The name of the person who owns the quick copy job and the job name.
COPIES=1	1 to 999 DELETE	The number of additional copies the user wants to print. 1-999: Prints the requested number of copies of the job. DELETE: Deletes the job from the printer's hard disk. After changing a setting, press SELECT.

Private/stored jobs menu

This menu provides a list of the stored jobs on the printer. The user can print or delete these jobs from the control panel. See the user guide for more information.

Note This menu appears only if you have an optional hard-disk accessory or 32 MB of memory installed and there are private or stored jobs on it.

Table 20. Private/stored jobs menu

Item	Value	Explanation
[USERNAME] [JOBNAME]		The name of the person who owns the quick copy job and the job name.
PIN:0000		To print the job, the user must enter the personal identification number (PIN) assigned to the job in the driver. See the user guide for more information.
COPIES=1	1 to 999 DELETE	The number of copies the user wants to print. 1-999: Prints the requested number of copies of the job. DELETE: Deletes the job from the printer. After changing a setting, press SELECT.

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Information menu

This menu contains printer information pages that give details about the printer and its configuration. To print an information page, use the ITEM key to scroll to the desired page and then press SELECT.

Table 21. Information menu

Item	Explanation
PRINT MENU MAP	The menu map shows the layout and current settings of the control panel menu items.
PRINT CONFIGURATION	The configuration page shows the printer's current configuration. If an HP JetDirect print server card is installed (HP LaserJet 4100N/TN/DTN printers), a JetDirect Configuration Page will also print.
PRINT PCL FONT LIST	The PCL font list shows all the PCL fonts currently available to the printer.
PRINT PS FONT LIST	The PS font list shows all the PS fonts currently available to the printer.
PRINT FILE DIRECTORY	This item appears only when a mass storage device (such as an optional flash DIMM or hard disk) containing a recognized file system is installed in the printer. The file directory shows information for all installed mass storage devices.
PRINT EVENT LOG	The event log lists the most current 20 printer events or errors.
SHOW EVENT LOG	This item allows you to view the most recent printer events on the control panel display. Press – VALUE + to scroll through the event log entries. **Note** The event log lists the error number (the first two digits), the error code, and the associated page count.
PRINT USAGE PAGE	The usage page shows the quantity of pages printed, as well as the paper source used. It also reflects the number of one-sided versus two-sided pages. **Note** This item will only show in the information menu if an optional hard-disk accessory or 32 MB of memory is installed in the printer. This item will generate a page containing information that can be used for accounting purposes.
PRINT SUPPLIES STATUS	When used with an HP genuine toner cartridge, the supplies status page shows toner cartridge information, statistics about the total number of pages by size and jobs processed, toner cartridge manufacture date and serial number, page counts, and maintenance information.

Table 21. Information menu (continued)

Item	Explanation
PRINT PAPER PATH TEST	The paper-path test can be used to verify that the paper path is working correctly, or to troubleshoot problems with a type of paper. Choose the input tray, output bin, duplexer (if available), and number of copies.

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Paper-handling menu

When paper-handling settings are correctly configured through the control panel, you can print by choosing the type and size of media from the printer driver or software application.

Some items in this menu (such as duplex and manual feed) are available from a software application, or from the printer driver (if the appropriate driver is installed). Printer driver and software application settings override control panel settings.

Table 22. Paper handling menu

Item/Default value	Values	Explanation
ENVELOPE FEEDER SIZE=COM10 (110 V printers) or SIZE=DL (220 V printers)	For supported print media sizes, see page 28.	This item appears only when the optional envelope feeder is installed. Set the value to correspond with the envelope size currently loaded in the envelope feeder.
ENVELOPE FEEDER TYPE=PLAIN	For supported print media types, see page 28.	This item appears only when the optional envelope feeder is installed. Set the value to correspond with the envelope type currently loaded in the envelope feeder.
TRAY 1 MODE= FIRST	FIRST CASSETTE	Determine how the printer will use tray 1. FIRST: If print media is loaded in tray 1, the printer will pull media from that tray first. CASSETTE**:** A media size must be assigned to tray 1 using the TRAY 1 SIZE option (the next item in this menu when TRAY 1 MODE=CASSETTE). This allows tray 1 to be used as a reserved tray.
TRAY 1 SIZE= LETTER (110 V printers) or A4 (220 V printers)	For supported print media sizes, see page 25 through page 27.	This item appears only when TRAY 1 MODE= CASSETTE. Set the value to correspond with the media size currently loaded in tray 1.
TRAY 1 TYPE= PLAIN	For supported print media types, see page 28.	This item appears only when TRAY 1 MODE= CASSETTE. Set the value to correspond with the print media type currently loaded in tray 1.
TRAY 2 TYPE= PLAIN	For supported print media types, see page 28.	Set the value to correspond with the media type currently loaded in tray 2.

Table 22. Paper handling menu (continued)

Item/Default value	Values	Explanation
TRAY 3 TYPE= PLAIN	For supported print media types, see page 28.	This item appears only when a third paper tray is installed. Set the value to correspond with the media type currently loaded in tray 3.
TRAY 4 TYPE= PLAIN	For supported print media types, see page 28.	This item appears only when a fourth paper tray is installed. Set the value to correspond with the media type currently loaded in tray 4.
SMALL PAPER SPEED=NORMAL	NORMAL SLOW	Select SLOW when alternating printing envelopes (or small media sizes) and standard media sizes and print problems appear. Be sure to return the speed to NORMAL when finished. When SLOW is selected, the printer briefly pauses between pages to reduce the possibility of a repeating image.
MANUAL FEED=OFF	OFF ON	Feed the print media manually from tray 1, rather than automatically from a tray. When MANUAL FEED=ON and tray 1 is empty, the printer goes offline when it receives a print job and displays MANUALLY FEED [PAPER SIZE].
DUPLEX=OFF	OFF ON	This item appears only when an optional duplexer is installed. Set the value to ON to print on both sides (duplex) or OFF to print on one side (simplex) of a sheet of paper.
BINDING= LONG EDGE	LONG EDGE SHORT EDGE	This item appears only when an optional duplexer is installed and DUPLEX=ON. Choose the binding edge when duplexing (printing on both sides of paper).

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Table 22. Paper handling menu (continued)

Item/Default value	Values	Explanation
CONFIGURE FUSER MODE MENU=NO	NO YES	Configure the fuser mode associated with each print media type. (This is only necessary if you experience loose toner problems, excessive curl, or other print-quality issues when printing on certain media types.) NO: The fuser-mode menu items are not available. YES: Additional items appear (see below). **Note** To see the default fuser mode for each media type, select YES, scroll back to the information menu, and print a menu map.
[TYPE]=NORMAL	NORMAL HIGH1 LOW HIGH2	This item appears only when CONFIGURE FUSER MODE MENU=YES. Most paper types are set to NORMAL fuser mode by default. The exceptions are as follows: ROUGH=HIGH1 TRANSPARENCY=LOW NORMAL fuser mode provides a fuser temperature for optimum results on most typical papers. HIGH1 fuser mode provides a higher fuser temperature. HIGH1 should be used with rough-textured or heavy paper if you have trouble with toner adhering to the page. LOW fuser mode provides a lower temperature, which can help reduce curl on lightweight paper and transparencies. However, toner might not adhere as well to the page. HIGH2 fuser mode uses the same higher temperature as HIGH1, but it also slows printer throughput, which creates the best fusing for very rough paper. **Note** HIGH2 fuser mode only operates for A4-, letter-, and legal-size paper, and slows the throughput to 16 pages per minute.

Printing menu

Some items in this menu can be used from a software application or from the printer driver (if the appropriate driver is installed). Printer driver and software application settings override control panel settings.

Table 23. Printing menu

Item	Values	Explanation
COPIES=1	1 TO 999	Set the default number of copies by selecting any number from 1 to 999. Press – VALUE + once to change the setting by increments of 1, or hold down – VALUE + to scroll by increments of 10.
PAPER SIZE=LETTER ENVELOPE=COM10 (110 V printers) or PAPER SIZE=A4 ENVELOPE=DL (220 V printers)	For supported print media sizes, see page 26 through page 28.	Set the default size for print media. (The item name changes from paper to envelope as you scroll through the available sizes.)
CONFIGURE CUSTOM PAPER=NO	NO YES	NO: The custom-paper menu items are not available. YES: The custom-paper menu items appear (see the next item).
UNIT OF MEASURE= INCHES (110 V printers) or MILLIMETERS (220 V printers)	INCHES MILLIMETERS	This item appears only when CONFIGURE CUSTOM PAPER=YES. Select the unit of measurement for the custom paper size.
X DIMENSION=8.5 INCHES (110 V printers) or 216 MILLIMETERS (220 V printers)	3.00 TO 8.5 INCHES (110 V printers) or 76 to 216 MILLIMETERS (220 V printers)	This item appears only when CONFIGURE CUSTOM PAPER=YES. Select the media width dimension to be fed into the printer (short edge).
Y DIMENSION=14.0 INCHES (110 V printers) or 356 MILLIMETERS (220 V printers)	5.00 TO 14.0 INCHES (110 V printers) or 127 to 356 MILLIMETERS (220 V printers)	This item appears only when CONFIGURE CUSTOM PAPER=YES. Select the media length dimension (long edge).
ORIENTATION= PORTRAIT	PORTRAIT LANDSCAPE	Determine the default orientation of print on the page.

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Table 23. Printing menu (continued)

Item	Values	Explanation
FORM LENGTH=60 LINES (110 V printers) or 64 LINES (220 V printers)	5 to 128	Sets vertical spacing from 5 to 128 lines for default paper size. Press – VALUE + once to change the setting by increments of 1, or hold down – VALUE + to scroll by increments of 10.
PCL FONT SOURCE=INTERNAL	INTERNAL SOFT SLOT 1, 2, OR 3 (depends on location of available fonts)	INTERNAL: Internal fonts. SOFT: Permanent soft fonts. SLOT 1, 2, or 3: Fonts stored in one of the three DIMM slots. **Note** Print a PCL font list (page 55) to see the available fonts.
PCL FONT NUMBER=0	0 TO 999 (depends on location of available fonts)	The printer assigns a number to each font and lists the numbers on the PCL font list. The font number appears in the font # column of the printout. **Note** Print a PCL font list (page 55) to see the available fonts.
PCL FONT PITCH= 10.00	0.44 to 99.99	This item might not appear, depending on the font selected. Press – VALUE + once to change setting by increments of 0.01 for pitch, or hold down – VALUE + to scroll by increments of 1.
PCL SYMBOL SET=PC-8	PC-8 many others	Select any one of several available symbol sets from the printer control panel. A symbol set is a unique grouping of all the characters in a font. A value of PC-8 or PC-850 is recommended for line drawn characters.

Table 23. Printing menu (continued)

Item	Values	Explanation
COURIER FONT=REGULAR	REGULAR DARK	Select the version of Courier font to use: REGULAR: The internal Courier font available on the HP LaserJet 4 series printers. DARK: The internal Courier font available since the HP LaserJet III series printers. Both fonts are not available at the same time.
WIDE A4=NO	NO YES	The WIDE A4 setting changes the number of characters that can be printed on a single line of A4 paper. NO: Up to 78 10-pitch characters can be printed on one line. YES: Up to 80 10-pitch characters can be printed on one line.
OVERRIDE A4/LETTER=NO	NO YES	Choose YES to print on letter-size paper automatically when an A4 job is sent, but no A4-size paper is loaded in the printer (or to print on A4-size paper when a letter job is sent, but no letter-size paper is loaded in the printer).
APPEND CR TO LF=NO	NO YES	Select YES to append a carriage return to each line feed encountered in backward-compatible PCL jobs (pure text, no job control). Some environments, such as UNIX, indicate a new line using only the line-feed control code. This option allows the user to append the required carriage return to each line feed.

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Print quality menu

Some items in this menu can be used from a software application, or from the printer driver (if the appropriate driver is installed). Printer driver and software application settings override control panel settings.

Table 24. Print quality menu

Item	Values	Explanation
RESOLUTION= FASTRES 1200	300 600 FASTRES 1200 PRORES 1200	Select the resolution from the following values: 300**:** Produces draft print quality at the printer's maximum speed; 300 dpi (dots per inch) is recommended for some bitmapped fonts and graphics, and for compatibility with the HP LaserJet III family of printers. 600**:** Produces high print quality at the printer's maximum speed. FASTRES 1200**:** Produces optimum print quality (comparable to 1200 dpi) at the printer's maximum speed. PRORES 1200**:** Produces optimum print quality (true 1200 dpi) at the printer's maximum speed. When the resolution is changed, any downloaded resources (such as fonts or macros) will need to be downloaded again, unless they are stored on an optional hard disk or flash DIMM.
RET=MEDIUM	OFF LIGHT MEDIUM DARK	Use the printer's Resolution Enhancement technology (REt) setting to produce print with smooth angles, curves, and edges. The REt does not affect print quality when the print resolution is set to ProRes 1200. All other print resolutions, including FastRes 1200, benefit from REt.

Table 24. Print quality menu (continued)

Item	Values	Explanation
ECONOMODE=OFF	OFF ON	Turn EconoMode on (to save toner) or off (for high quality). EconoMode creates draft-quality printing by reducing the amount of toner on the printed page by up to 50 percent. **Caution** Hewlett-Packard does not recommend constant use of EconoMode. If EconoMode is always used, the toner supply might outlast the mechanical parts in the toner cartridge.
TONER DENSITY=3	1 2 3 4 5	Lighten or darken the print on the page by changing the toner density setting. The settings range from 1 (light) to 5 (dark), but the default setting of 3 usually produces the best results. Use a lower toner density setting to save toner.
AUTO CLEANING PAGE=OFF	ON OFF	Set AUTO CLEANING PAGE=ON to have the printer automatically create and process a cleaning page (to remove debris from the fuser) per the interval specified in the next item.
AUTO CLEANING FREQUENCY=2000	1000 2000 5000 10,000 20,000	This item appears when AUTO CLEANING PAGE=ON. Select the page interval for automatically creating and processing a cleaning page.
CLEANING PAGE SIZE= LETTER (110 V printers) or A4 (220 V printers)	LETTER A4	This item appears when AUTO CLEANING PAGE=ON. This sets the media size upon which the auto cleaning page is processed. The default media size corresponds with the cold-reset media size.

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Table 24. Print quality menu (continued)

Item	Values	Explanation
CREATE CLEANING PAGE	No value to select.	Press SELECT to print a cleaning page (for cleaning excess toner from the fuser assembly). In order for the cleaning page to work correctly, print the page on copier-grade paper (not bond or rough paper). Follow the instructions on the cleaning page.
PROCESS CLEANING PAGE	No value to select.	This item appears only after a cleaning page has been created (as described above). Follow the instructions on the cleaning page. **Note** It might take approximately two minutes for the printer to finish processing the cleaning page.

Configuration menu

Items in this menu affect the printer's behavior. Configure the printer according to printing needs.

Table 25. Configuration menu

Item	Values	Explanation
POWERSAVE TIME= 30 MINUTES	1 MINUTE 15 MINUTES 30 MINUTES 1 HOUR 2 HOURS 4 HOURS	Set the printer to enter PowerSave after it has been idle for a specified amount of time. Turning PowerSave off is not recommended. The PowerSave feature does the following: • Minimizes the amount of power consumed by the printer when it is idle. • Reduces wear on the printer's electronic components by turning off the backlight on the display. When you send a print job, press a control panel key, open a paper tray, or open the top cover, the printer automatically comes out of PowerSave mode. **Note** PowerSave turns off the backlight on the display, but the display is still readable.
TONER LOW= CONTINUE	CONTINUE STOP	Determine how the printer behaves when toner is low. A toner-low message first appears on the display when about 15 percent of the toner remains in the cartridge (about 1,500 pages remaining for the 10,000-page cartridge and about 900 pages remaining for the 6,000-page cartridge at 5 percent page coverage). CONTINUE: The printer will continue to print with the message displayed. STOP: The printer will stop printing and further action is required.
TONER OUT= CONTINUE	CONTINUE STOP	Determine how the printer behaves when toner is out. A toner-out message appears on the display when the toner cartridge is out of toner. CONTINUE: The printer will continue to print with the message displayed. However, the print quality might be very poor or difficult to see. STOP: The printer will stop printing and further action is required.

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Table 25. Configuration menu (continued)

Item	Values	Explanation
CLEARABLE WARNINGS=JOB	JOB ON	Set the length of time that a clearable warning appears on the printer control panel. JOB: Warning messages appear on the control panel until the end of the job from which they were generated. ON: Warning messages appear on the control panel until Go is pressed.
AUTO CONTINUE= ON	ON OFF	Determine how the printer reacts to errors. ON: If a minor error occurs that prevents printing, the message will appear, and the printer will go offline for 10 seconds before returning online. OFF: If a minor error occurs that prevents printing, the message will remain on the display and the printer will remain offline until Go is pressed. If the printer is on a network, you will probably want to turn AUTO CONTINUE to ON.
JAM RECOVERY= AUTO	AUTO ON OFF	Determine how the printer behaves when a jam occurs. AUTO: The printer automatically selects the best mode for printer jam recovery (usually ON). ON: The printer automatically reprints pages after a jam is cleared. OFF: The printer does not reprint pages following a jam. Printing performance might be increased with this setting.
MAINTENANCE MESSAGE=OFF	OFF	This item appears only after the PERFORM PRINTER MAINTENANCE message appears on the display. OFF: The PERFORM PRINTER MAINTENANCE message will be temporarily cleared but will return after 5 percent of the printer maintenance interval (or after approximately 10,000 pages). The message should be turned off only while waiting for the printer maintenance kit to be installed. If the required maintenance is not performed, the printer's performance will degrade.
PRINT PS ERRORS= OFF	OFF ON	Select ON to print the PS error page when PS errors occur.

Table 25. Configuration menu (continued)

Item	Values	Explanation
RAM DISK=AUTO	OFF AUTO	Determine how the RAM disk is configured. This item appears only if there is no optional hard-disk accessory installed and the printer has at least 16 MB of memory. OFF: The RAM disk is disabled. Configure the amount of memory to be used through the following item: RAM DISK SIZE. **Note** If the setting is changed from OFF to AUTO or from AUTO to OFF, the printer will automatically reinitialize.
QUICK COPY JOBS=32	0 to 50	Specifies the number of quick copy jobs that can be stored on the printer's hard-disk accessory.
HELD JOB TIMEOUT=OFF	OFF 1 HOUR 4 HOURS 1 DAY 1 WEEK	Sets the amount of time that stored jobs are kept before being automatically deleted from the printer.
PERSONALITY= AUTO	AUTO PCL PS	Select the default printer language (personality). Possible values are determined by which valid languages are installed in the printer. Normally, you should not change the printer language (the default is AUTO). If you change it to a specific printer language, the printer will not automatically switch from one language to another unless specific software commands are sent to the printer.

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I/O menu

Items in the I/O (input/output) menu affect the communication between the printer and the computer.

Table 26. I/O menu

Item	Values	Explanation
PARALLEL ADV COMMUNICATN=ON	ON OFF	Turn the bidirectional parallel communication on or off. The default is set for a bidirectional parallel port (IEEE-1284). This setting allows the printer to send status readback messages to the computer. (Turning on the parallel advanced functions might slow language switching.)
PARALLEL HIGH SPEED=YES	YES NO	Select the speed at which data is transmitted to the printer. YES: The printer accepts faster parallel communications used for connections with newer computers. NO: The printer accepts slower parallel communications used for connections with older computers.
I/O TIMEOUT=15 SECONDS	5 to 300 SECONDS	Select the I/O timeout period in seconds. (The I/O timeout refers to the time, measured in seconds, that the printer waits before ending a print job.) This setting allows you to adjust timeout for best performance. If data from other ports appear in the middle of your print job, increase the timeout value. Press – VALUE + once to change settings by increments of 1, or hold down – VALUE + to scroll by increments of 10.

EIO menu (networked printers)

The EIO (enhanced input/output) menu appears only when an EIO device is installed in an EIO slot on the printer (such as an HP JetDirect print server). The items in the menu depend on the particular accessory product installed. If the printer contains an HP JetDirect print server EIO card, you can configure basic networking parameters using the EIO menu. These and other parameters can also be configured through HP Web JetAdmin.

Table 27. EIO menu

Item	Values	Explanation
CFG NETWORK=NO	NO YES	Select whether or not you want to use the HP JetDirect menu. NO: Bypass the HP JetDirect menu. YES: Use the HP JetDirect menu. You must change this to YES each time you want to use the menu. **Note** You must select CFG NETWORK=YES to display the following items.
IPX/SPX=ON	ON OFF	Select whether the IPX/SPX protocol stack (in Novell NetWare networks, for example) is enabled (ON) or disabled (OFF).
DLC/LLC=ON	ON OFF	Select whether the DLC/LLC protocol stack is enabled (ON) or disabled (OFF).
TCP/IP=ON	ON OFF	Select whether the TCP/IP protocol stack is enabled (ON) or disabled (OFF).
ATALK=ON	ON OFF	Select whether the Apple EtherTalk protocol stack is enabled (ON) or disabled (OFF).

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Table 27. EIO menu (continued)

Item	Values	Explanation
CFG IPX/SPX=NO	NO YES	Select whether you want to use the IPX/SPX menu and set IPX/SPX protocol parameters. NO: Bypass the IPX/SPX menu items. YES: Use the IPX/SPX menu items. In the IPX/SPX menu, you can specify the frame-type parameter used on your network. The default is AUTO, to automatically set and limit the frame type to the first one detected. For Ethernet cards, frame type selections are EN_8023, EN_II, EN_8022, EN_SNAP. For Token Ring cards, frame type selections include TR_8022, TR_SNAP. In the IPX/SPX menu for Token Ring cards, you can also specify NetWare Source Routing parameters, which are SRC RT=AUTO (default), OFF, SINGLE R, or ALL RT.
CFG TCP/IP=NO	NO YES	Select whether you want to use the TCP/IP menu and set TCP/IP protocol parameters. NO: Bypass the TCP/IP menu items. YES: Use the TCP/IP menu items. In the TCP/IP menu, you can specify BOOTP=YES or DHCP=YES for TCP/IP parameters to be automatically loaded from a bootP or DHCP server when the printer is turned on. If you specify BOOTP=NO and DHCP=NO, you can manually set the following TCP/IP parameters from the control panel: each byte of the IP address (IP), Subnet Mask (SM), Syslog Server (LG), and Default Gateway (GW). You can also manually set the idle timeout period. Print an HP JetDirect configuration page to verify your settings. However, note that the print server might overwrite selected parameters with values that ensure proper operation.

Table 27. EIO menu (continued)

Item	Values	Explanation
CFG LINK=NO	NO YES	Select whether you want to manually configure the HP JetDirect 10/100Base-TX print server's network link speed and communication mode. The HP JetDirect settings must match the network. NO: Bypass the link configuration menu items. YES: Use the link configuration menu items. One of the following link configurations can be set: AUTO: The print server will automatically configure itself to match the network's link speed and communication mode. 10T HALF: 10 Mbps, half-duplex operation. 10T FULL: 10 Mbps, full-duplex operation. 100T HALF: 100 Mbps, half-duplex operation. 100T FULL: 100 Mbps, full-duplex operation.

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Resets menu

Use the reset and restore options on this menu with caution. You can lose buffered page data or printer configuration settings when you select these items. Only reset the printer under the following circumstances:

- You want to restore the printer's default settings.
- Communication between the printer and computer has been interrupted.

The items in the resets menu will clear all memory in the printer, while CANCEL JOB clears only the current job.

Table 28. Resets menu

Item	Values	Explanation
NEW TONER CARTRIDGE=NO	NO YES	Change the value to YES when you first install a non-HP toner cartridge. YES allows the printer to recognize the new cartridge, and the printer resets the toner gauge to full.
RESTORE FACTORY SETTINGS		Press SELECT to perform a simple reset and restores most of the factory (default) settings. This item also clears the input buffer for the active I/O.
POWERSAVE= ON	ON OFF	This item turns the PowerSave mode on or off. POWERSAVE=ON mode does the following: • Minimizes the amount of power consumed by the printer when it is idle • Reduces wear on the printer's electronic components by turning off the backlight on the display When you send a print job, press a control panel key, open a paper tray, or open the top cover, the printer automatically comes out of PowerSave mode. In the configuration menu, you can set how long the printer remains idle before it enters PowerSave mode. Turning PowerSave off is not recommended. **Note** PowerSave turns off the backlight on the display, but the display is still readable.

Service mode

Service mode should be used only by authorized service personnel. The following can be done in service mode:

- Verify and set the page count and serial number. These are shown on the configuration page.
- Set the cold reset paper size default. (This sets the factory default paper size to either Letter or A4).
- Turn the diagnostic functions on or off (for software developers only).
- Clear the event log.
- Set the interval at which the PERFORM PRINTER MAINTENANCE message appears on the control panel display.

To enter service mode:

1. While turning on the printer, hold down SELECT and CANCEL JOB until all of the lights on the control panel are lit.
2. Press the right side of the MENU key, then press SELECT. The message SERVICE MODE temporarily appears and will reappear when the printer completes the initialization process.
3. To exit the service mode, press GO.

Note If READY appears in the control panel, the keys might have been released too soon, or the wrong keys were pressed.

Note Before replacing the formatter or firmware DIMM, print a configuration page and a menu map to verify the current printer settings. Use the information on these pages to reset the customer's printer settings.

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Service menu

To enter the service menu, see “Service mode” on page 74.

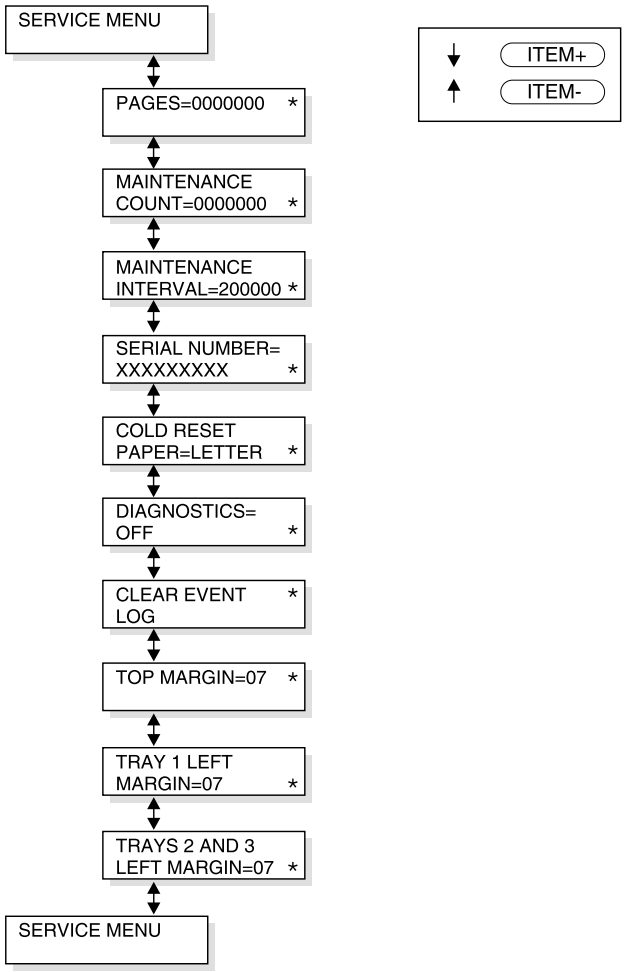

Figure 6. **Service menu**

Changing settings

The item-count value is changed using a different method than is used for other control panel values. Instead of increasing the entire value by increments, each digit can be selected and modified individually. The following control panel keys are used to modify the page count value:

SELECT	Enters any changes to the current digit and advances the cursor one digit to the right. If the last digit is currently selected, pressing the SELECT key wraps the cursor around to the first digit.
VALUE -	Increases the value of the currently selected digit by one. Pressing VALUE + when 9 is the value of the currently selected digit will change the value of the digit to 0.
– VALUE	Decreases the value of the currently selected digit by one. Pressing – VALUE when 0 is the value of the currently selected digit will change the value of the digit to 9.

Table 29 shows the sequence of keystrokes used to change the page count from a value of 000000 to a value of 0010480.

Table 29. Changing the page count (example)

Key press	Display	Description
	SERVICE MODE	
MENU+	SERVICE MENU	Enter the SERVICE MENU.
ITEM+	PAGES=0000000 *	Advance to the first item in the SERVICE MENU.
SELECT	PAGES=0000000 *	Advance the cursor one digit to the right.
SELECT	PAGES=0000000 *	Advance the cursor one digit to the right.
VALUE +	PAGES=0010000 *	Increase the value of the third digit by one.
SELECT	PAGES=0010000 *	Enter the change to the third digit and advance the cursor one digit to the right.
SELECT	PAGES=0010000 *	Advance the cursor one digit to the right.
VALUE + (4 presses)	PAGES=0010400 *	Increase the value of the fifth digit by four.
SELECT	PAGES=0010400 *	Enter the change to the fifth digit and advance the cursor one digit to the right.
– VALUE (2 presses)	PAGES=0010480 *	Decrease the value of the sixth digit by two.
SELECT (2 presses)	PAGES=0010480 *	Enter the change to the sixth digit and advance the cursor one digit to the right causing the cursor to wrap around to the first digit.
GO		Exit.

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Page count

The page count that is stored in nonvolatile memory (NVRAM) and is shown on the configuration page printout represents the number of pages the printer has printed (excluding engine test prints). If it is necessary to install a new formatter in the printer, the page count must be reset so that it represents the age of the printer engine rather than the age of the formatter.

Note Before replacing the formatter or firmware DIMM, print a configuration page and a menu map to verify the current printer settings. Use the information on these pages to reset the customer's printer settings.

Maintenance count

The maintenance count should be reset only after a maintenance kit has been installed. For more information, see page 86.

Maintenance interval

The MAINTENANCE INTERVAL in the service-mode menu sets the page count interval at which the next service is due for the printer. This is set initially at the factory to 200,000 pages. (For example, the PERFORM PRINTER MAINTENANCE message appears at 200,000 pages. If the printer maintenance kit is installed at 200,114 pages, the message reappears 200,000 pages later, at 400,114 pages.) The procedure for editing this number is similar to editing the PAGES item.

Serial number

The printer serial number is stored in NVRAM. If a formatter is replaced, then the printer serial number must be reentered. The procedure for editing this number is similar to editing the PAGES item.

Note Before replacing the formatter or firmware DIMM, print a configuration page and a menu map to verify the current printer settings. Use the information on these pages to reset the customer's printer settings.

Cold reset paper

The cold reset paper size is stored in NVRAM. When a printer cold reset is performed, the default paper size (in the printing menu) is set to the value saved for the cold reset paper size. Possible values are COLD RESET PAPER=LETTER and COLD RESET PAPER=A4. When replacing the formatter in countries that use A4 rather than letter-size paper, set the cold reset paper size to A4.

Diagnostics

This menu item enables or disables the use of the firmware diagnostic features for software development. Possible values are DIAGNOSTICS=OFF* and DIAGNOSTICS=ON. When enabled, the diagnostic features are available when the printer is in the online READY state by pressing the SELECT key.

Note The feature above is for software developers only.

Clear event log

This item deletes all items that have been recorded in the internal event log.

Top margin

This item can be used to adjust the margin between the top of the page and the top of the printed image.

Note Adjust the top margin value in the software application first. This top margin value does not affect the engine test top margin.

Before adjusting the top margin through the service menu, first ensure the engine test top margin register is properly adjusted (page 175).

To set the top margin registration value:

1. Press the ITEM key to scroll through the service menu until `TOP MARGIN=07` appears.
2. Press the VALUE key to increase or decrease the margin.
3. Press the SELECT key to save the new margin adjustment.

Tray 1 left margin

This item can be used to adjust the margin between the left side of the pages from tray 1 and the left side of the printed image.

1. Press the ITEM key until `TRAY 1 LEFT MARGIN=07` appears.
2. Press the VALUE key to increase or decrease the margin.
3. Press the SELECT key to save the new margin adjustment.

Trays 2 and 3 left margin

This item can be used to adjust the margin between the left side of the pages from trays 2 and 3 and the left side of the printed image.

1. Press the ITEM key until `TRAYS 2 AND 3 LEFT MARGIN=07` appears.
2. Press the VALUE key to increase or decrease the margin.
3. Press the SELECT key to save the new margin adjustment.

Testing the printer

When you print a configuration page, the printer checks its internal controller and I/O interface, and then prints a test page. You can review the configuration page printout to verify proper installation of such options as paper trays or printer languages. For more information, see page 227.

Engine test

The engine test print can be used to verify that the print engine is functioning correctly. For more information, see page 190.

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Resetting the printer

Cold reset

Cold reset clears all data from the printer memory and sets many of the defaults back to the factory settings.

CAUTION Performing a cold reset resets the HP JetDirect configuration. To avoid making changes to your configuration, remove the HP JetDirect card before performing a cold reset.

If possible, print a configuration page and a menu map to verify the current printer settings. Use the information on these pages to reset the customer's printer settings.

To perform a cold reset:

1. Print a configuration page and a menu map.
2. Turn on the printer while holding the GO key down.
3. When COLD RESET appears on the control panel display, release the GO key.

Clearing NVRAM

This procedure will clean up the NVRAM by removing old areas that are not being used.

1. Turn off the printer.
2. Hold down the CANCEL JOB key, and then turn on the printer.
3. When CLEANUP NVRAM appears on the control panel display, release the CANCEL JOB key.

Initialization of NVRAM

Initialization of NVRAM should always be executed immediately after replacing the formatter board. This procedure aligns the firmware with the formatter. Not initializing NVRAM could result in deterioration of print quality.

CAUTION Initializing NVRAM will erase several of the memory settings (including page count, printer serial number, and the event log).

Note Before initializing NVRAM, print a configuration page and a menu map to verify the current printer settings. Use the information on these pages to reset the customer's printer settings.

To initialize NVRAM

1. Print a configuration page and a menu map.
2. Turn off the printer.
3. Remove all formatter accessories (EIO cards, hard drive, DIMMs, etc.).
4. While turning on the printer, hold down SELECT and CANCEL JOB until all of the lights on the control panel are lit.
5. Press CANCEL JOB, and then SELECT. The NVRAM INIT message appears on the control panel display.
6. After initializing the NVRAM, use service mode to reenter the settings from the configuration page.

Initialization of the hard disk

To initialize the hard disk

1. Print a configuration page and a menu map.
2. Turn off the printer.
3. While turning on the printer, hold down SELECT and CANCEL JOB until all of the lights on the control panel are lit.
4. Press MENU-, and then VALUE-.
5. Press SELECT.

System configuration

MS-DOS system configuration

To communicate properly with the printer, the MS-DOS® environment requires the addition or modification of **mode** commands in the AUTOEXEC.BAT file. Add or modify the **mode** command(s), depending on the interface configuration, as follows:

Parallel DOS commands

Most IBM- and AT-compatible computers default to a parallel printer port. To ensure that information is sent to the parallel printer port, type the following MS-DOS command at the MS-DOS prompt or include it in the Autoexec.bat file:

```
MODE LPT1: , , P
```

For MS-DOS version 4.0 and above, type:

```
MODE LPT1: , , B
```

Note This example assumes that you are using parallel printer port LPT1. If you are using LPT2 or LPT3, replace LPT1 in the example with the printer port that you are using.

Since the **mode** command is an external MS-DOS command (a program named **mode.com** is run when the **mode** command is invoked), the program file must be contained in the root directory, or in a directory specified in a preceding **path** command in the Autoexec.bat file.

After changing the Autoexec.bat file, restart the computer to initiate the changes.

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4 Printer maintenance

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Cleaning the printer and accessories

To maintain superior print quality and performance, thoroughly clean the printer and the paper-handling accessories:

- after printing approximately 10,000 pages.
- whenever print quality problems occur.

Also, run a cleaning page every time you change the toner cartridge.

Clean the outside surfaces of the printer and accessories with a water-dampened cloth. Clean the inside parts as indicated in table 30 on page 83. Observe the warning and caution below.

WARNING! Before beginning these steps, turn the printer off and unplug all power cords to avoid shock hazard.

Be careful when cleaning around the fusing assembly area. It might be hot.

CAUTION To avoid permanent damage to the toner cartridge, do not use ammonia-based cleaners on or around the printer.

Do not touch the transfer roller. Skin oils on the roller can cause print quality defects. If toner gets on clothing, wipe it off with a dry cloth and wash the clothes in cold water. Hot water sets toner into fabric.

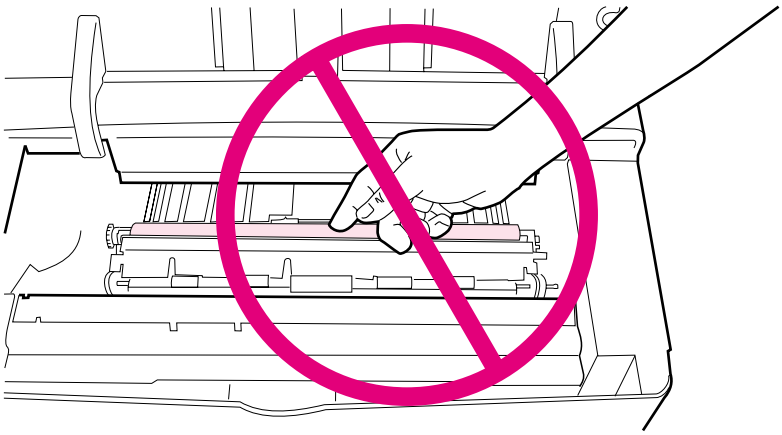

Figure 7. **Location of the transfer roller – Do Not Touch!**

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Table 30. Cleaning the printer

Component	Cleaning method/notes
Outside covers	Use a water-dampened cloth. Do not use solvents or ammonia-based cleaners.
Inside	With a dry, lint-free cloth, wipe any dust, spilled toner, and paper particles from the paper path area, the registration roller, and the toner cartridge cavity. Do not touch the transfer roller with bare hands.
Paper pickup, feed, and separation rollers	Use a water-dampened, lint-free cloth.
Tray 1 separation pad	Use a dry, lint-free cloth.
Registration roller	Use a dry, lint-free cloth.
Transfer roller	Use a dry, lint-free cloth. DO NOT TOUCH the transfer roller.
Fuser	Use a water-dampened, lint-free cloth.

Using the printer cleaning page

If toner specks appear on the front or back side of print jobs, follow the procedure below.

From the printer control panel, do the following:

1. Press MENU until PRINT QUALITY MENU appears.
2. Press ITEM until CREATE CLEANING PAGE appears.
3. Press SELECT to create the cleaning page.
4. Follow the instructions on the cleaning page to complete the cleaning process.

Note In order for the cleaning page to work correctly, print the page on copier-grade paper (not bond or rough paper).

You might need to create and process a cleaning page more than once. When toner has been cleaned from the fuser assembly, shiny black spots will appear on the page's black strip. If white spots appear on the black strip, create another cleaning page.

To ensure good print quality with certain types of paper, use the cleaning page every time the toner cartridge is replaced. If the cleaning page is frequently needed, try a different type of paper.

Using the auto-cleaning page

The auto-cleaning page feature helps keep the fuser rollers clean, which maintains excellent output quality. The auto-cleaning page feature is accessible through the control panel and is supported through Web JetAdmin, as well. Once set up, the printer runs a cleaning page through the printer as a separate job at the frequency requested with no further user intervention. The settings can be changed or the feature can be turned off at any time.

Note Once the auto-cleaning page feature is enabled, the printer automatically pulls plain letter- or A4-sized media from a tray. If the paper size or types are not available in the printer, a message appears in the control panel display requesting the user to load media into the printer.

To override a paper load message, press GO, and then answer the questions on the control panel display.

To set up the auto-cleaning page:

1. Press MENU until PRINT QUALITY MENU appears.
2. Press ITEM until AUTO CLEANING PAGE appears.
3. Press VALUE+ until =ON appears, and then press SELECT.
4. Press VALUE+ to select the auto cleaning frequency, and then press SELECT.
5. Press ITEM until CLEANING PAGE SIZE=LETTER or A4, and then press VALUE+ to select the paper size to be used for cleaning.
6. Press SELECT to save the auto-cleaning settings.

Note The auto cleaning page takes about 2.5 minutes to process.

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Cleaning spilled toner

Defective or worn out toner cartridges can develop leaks. Also, after a jam has occurred, there might be some toner remaining on the rollers and guides inside the printer. The pages that print immediately after the jam might pick up this toner.

Clean spilled toner with a cloth dampened with cold water. Do not touch the transfer roller with the damp cloth or with your fingers. Do not use a vacuum cleaner unless it is equipped with a micro-fine particle filter.

Performing printer maintenance

The printer maintenance cycle for this printer is every 200,000 pages. The kit contains the following replacement parts:

- one fuser
- one transfer roller
- one transfer roller tool
- one pickup roller (for tray 1)
- six feed and separation rollers (for trays 2, 3, and 4)
- one pair of disposable gloves
- instructions

See the instructions included in the kit for detailed replacement procedures.

The maintenance kit can be ordered from the Customer Services and Support Center. To order the maintenance kit, see page 270.

Table 31. Maintenance kit part numbers

Description	Exchange no.	Product no.
Maintenance kit (110 V)	C8057-69001	C8057A
Maintenance kit (220 V)	C8058-69001	C8058A

Reset maintenance count

The maintenance page count should be reset only after a maintenance kit has been installed.

This resets the maintenance counter so that the message `PERFORM PRINTER MAINTENANCE` will appear after another 200,000 pages (default).

1. Hold down the - ITEM and - VALUE keys.
2. Turn the printer on.
3. Wait for `RESET MAINTENANCE COUNT` to appear and then release both keys.

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Expected life of components

The following table shows the expected life of certain components in the printer. To order parts, see chapter 8.

Table 32. Life of components

No.	Part name	Part number	Expected life
1	Tray 1 pickup roller	RG5-3718-000CN	100,000 pages (for tray 1)
2	Tray 1 separation pad	RF5-3086-000CN	200,000 pages (for tray 1)
3	Tray 1 pickup assembly	RG5-5084-000CN	200,000 pages (for tray 1)
4	Feed and separation rollers (trays 2, 3, and 4)	RF5-3114-000CN	200,000 pages
5	Fuser 110 V 220 V	 RG5-5063-000CN RG5-5064-000CN	 200,000 pages 200,000 pages
6	Transfer roller	RG5-5295-000CN	200,000 pages
7	Cooling fan	RH7-1442-000CN	25,000 hours
8	Duplexer exhaust fan	RH7-1443-000CN	25,000 hours

Note If an HP LaserJet 4100 series printer component is not listed above, the component should last the life of the printer.

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5 Theory of operation

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AC/DC power distribution

In this circuit, the AC power input from the power receptacle is converted into DC power. The DC power is supplied to the loads.

The AC power is supplied to the low-voltage power supply circuit in the engine controller board when the power switch (SW1) is turned on.

The AC power is converted into +24 VDC, +5 VDC, and +3.3 VDC in the circuit. The +24 VDC is supplied to the main motor, scanner motor, solenoids, clutches, and to the high-voltage power supply circuit. The +5 VDC is supplied to the laser and formatter, while +3.3 VDC is supplied to the sensors and ICs on the engine controller board.

The +24 VDC is divided into +24 VA, which is constantly supplied from the low-voltage power supply circuit, and +24 VB, which is interrupted when the interlock switch (SW101) is turned off by opening the top cover. The +24 VB is supplied to the high-voltage power supply circuit on the engine controller board and relay (RL102). It also functions as a door-open detection signal (/DOPEN), so that the CPU detects an open door.

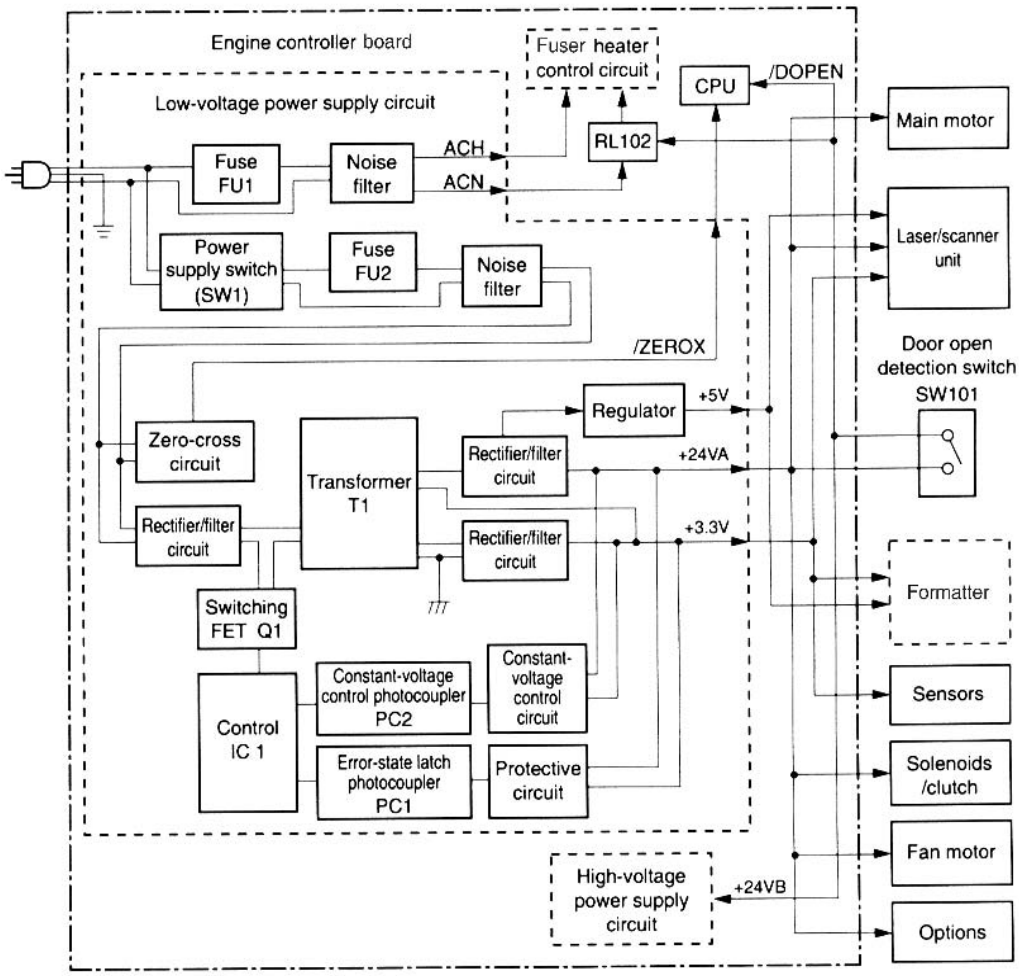

Figure 8. **Low-voltage power supply circuit**

Overcurrent/overvoltage protection

If a short-circuit or other problem on the load side causes an excessive current flow or generates abnormal voltage, the overcurrent/overvoltage protection systems automatically cut off the output voltage to protect the power supply circuit.

If the overcurrent or overvoltage protection system are activated and the power supply circuit does not generate DC voltage, it is necessary to turn the power off, correct the problem, and then turn the printer on again.

The circuit has two fuses (FU1, FU2), which break and cut off the output voltage if overcurrent flows through the AC line.

Fuser over-temperature protection

The fusing heater safety circuit is located on the engine controller board and constantly monitors the fusing temperature.

To protect the fuser from excessive temperatures, the printer has the following three protective functions:

- The CPU monitors the voltage of the FSRTH1 and FSRTH2 thermistor signals. If the fuser temperature reaches 240° C (464° F), then the CPU turns off the relay (RL101) to interrupt the power to the fusing heater.
- If the temperature of the fusing heater continues to rise abnormally and the temperature of the thermal switch (TP101) exceeds about 250° C (482° F), TP101 opens up to cut off the power supply to the fusing heater.
- The power supply on the coil side of RL101 and RL102 is connected to +24 VB. When the top cover is opened, the power supply to RL101 and RL102 is cut off and the relay is turned off.

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High-voltage power distribution

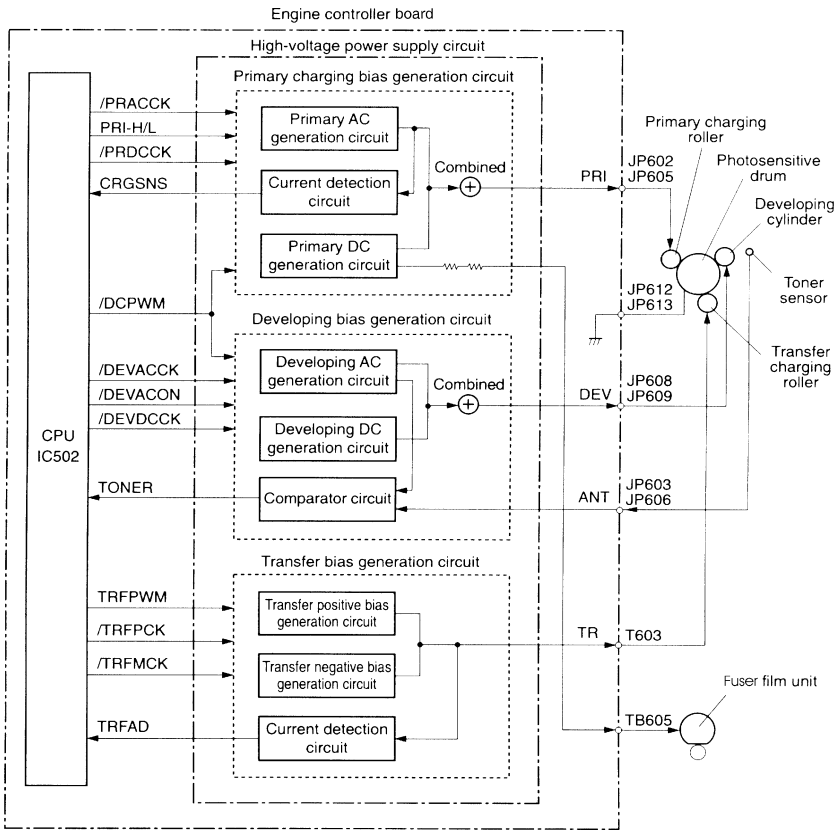

Figure 9. **Engine controller board**

In response to the instructions from the microprocessor (CPU:IC502) on the engine controller board, the high-voltage power supply circuit applies high voltage to the primary charging roller, developing cylinder, transfer roller, and the fuser film unit.

The circuit also detects the toner level and the presence or absence of the toner cartridge.

Toner-cartridge detection

This printer has cartridge detection and toner-level detection.

For the cartridge detection, the CPU checks the voltage of the cartridge detection signal (CRGSNS), which is a feedback signal for the primary charging. The CPU checks the voltage of the CRGSNS signal several times while the primary charging AC bias is applied to the primary charging roller. When the average of the voltage is 1 V or less, the CPU recognizes a "cartridge out" situation.

Cartridge memory

This memory is built-in EEPROM in the cartridge, so that the printer is capable of detecting the cartridge conditions.

Read/write of the cartridge memory is performed by the memory controller board through the antenna unit. The cartridge information read by the memory controller is updated by the engine controller and written to the memory. The read/write of the memory is implemented when the memory controller board receives a command from the engine controller board.

The engine controller instructs the memory controller to perform read/write at the following timing.

Reading timing

- When the power is turned on
- When the door is closed
- When the engine controller receives a command from the formatter

Writing timing

- When printing is completed
- When the engine controller receives a command from the formatter

The memory data sent from the memory controller also contains the error status that has occurred during read/write operation. When error status is sent, the engine controller attempts to read the operation four times. If the error status is not cleared after the operation, the engine controller determines one of the following error conditions: sub-CPU failure, memory data abnormality, or memory access abnormality.

CAUTION Do not remove the toner cartridge when the top cover interlock is overridden. Cartridge memory will be disabled.

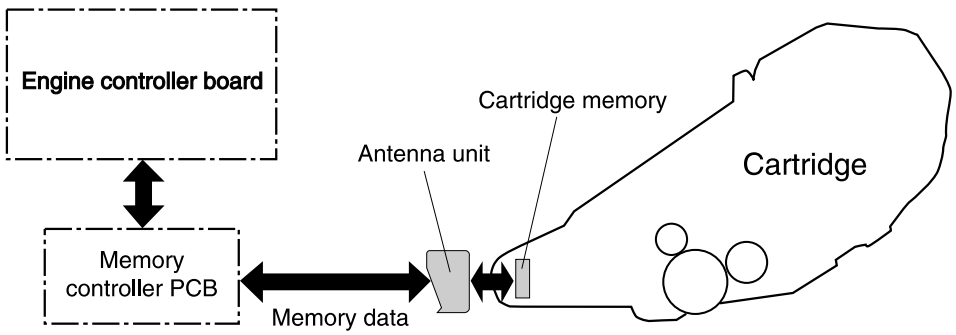

Figure 10. Cartridge memory

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Engine controller system

The following systems and functions are controlled by the engine controller board:

- DC power distribution (+3.3 V DC, +5 V DC, +24 VA)
- Laser and scanner drive
- Paper-motion monitoring and control (photosensors and flags)
- Clutches (tray pickup and tray 1 feed)
- Engine test
- Motors (main drive, scanner, and fans)

Printer operations are controlled by the CPU on the engine controller board. When you press the power button, the printer enters standby mode until it receives a print command or image data. The CPU then sends the signals to drive internal components, such as laser diodes, motors, and solenoids.

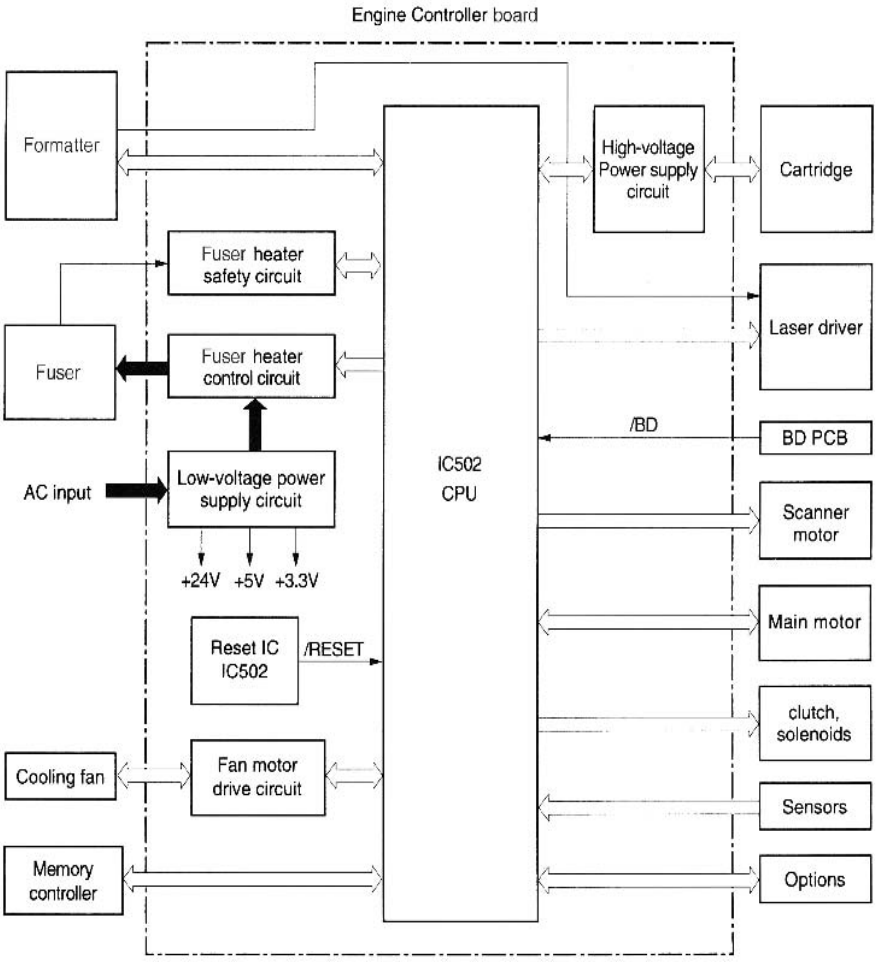

Figure 11. **Engine controller board**

Engine controller board inputs and outputs

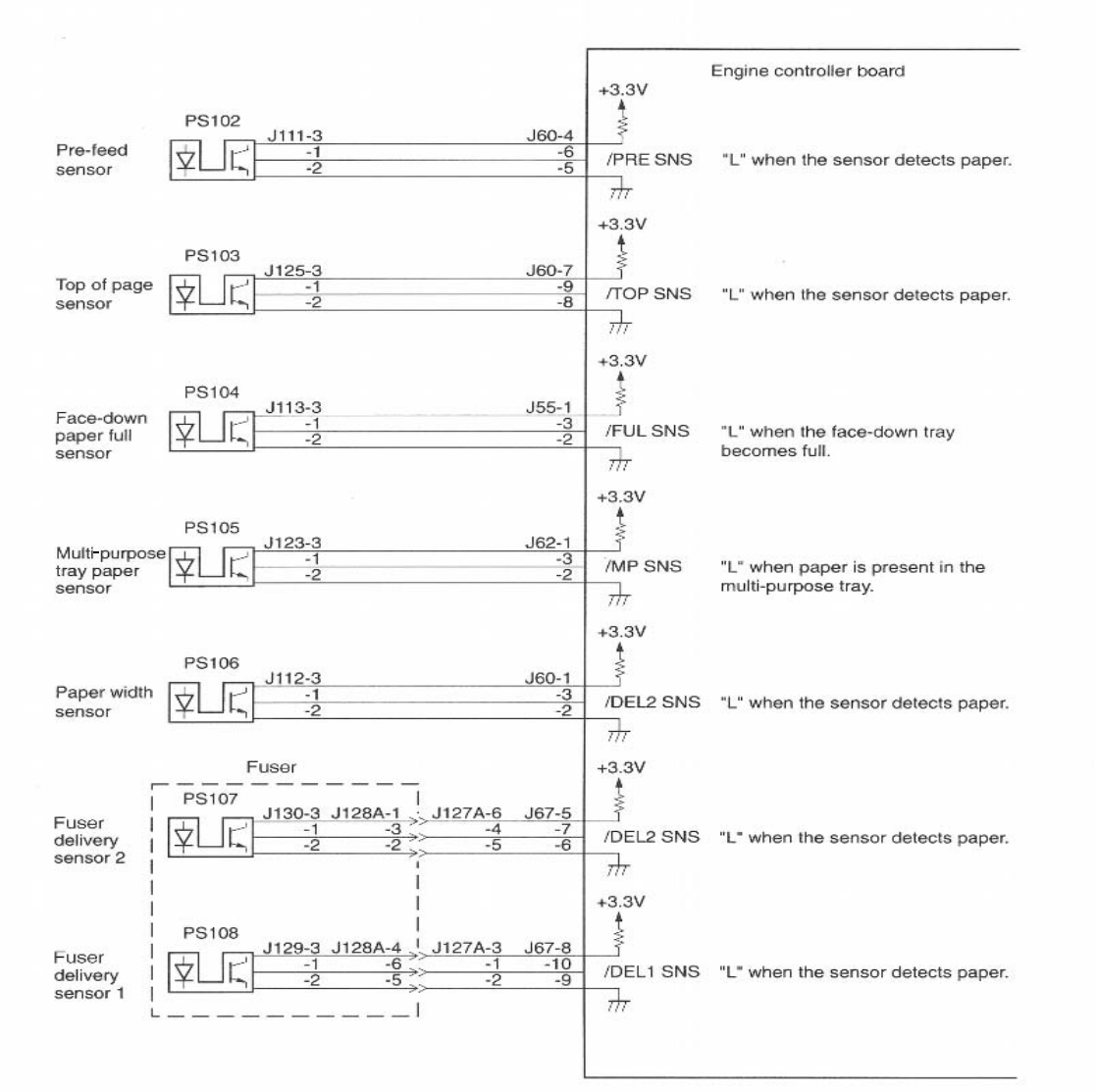

Figure 12. **Engine controller board I/O (1 of 5)**

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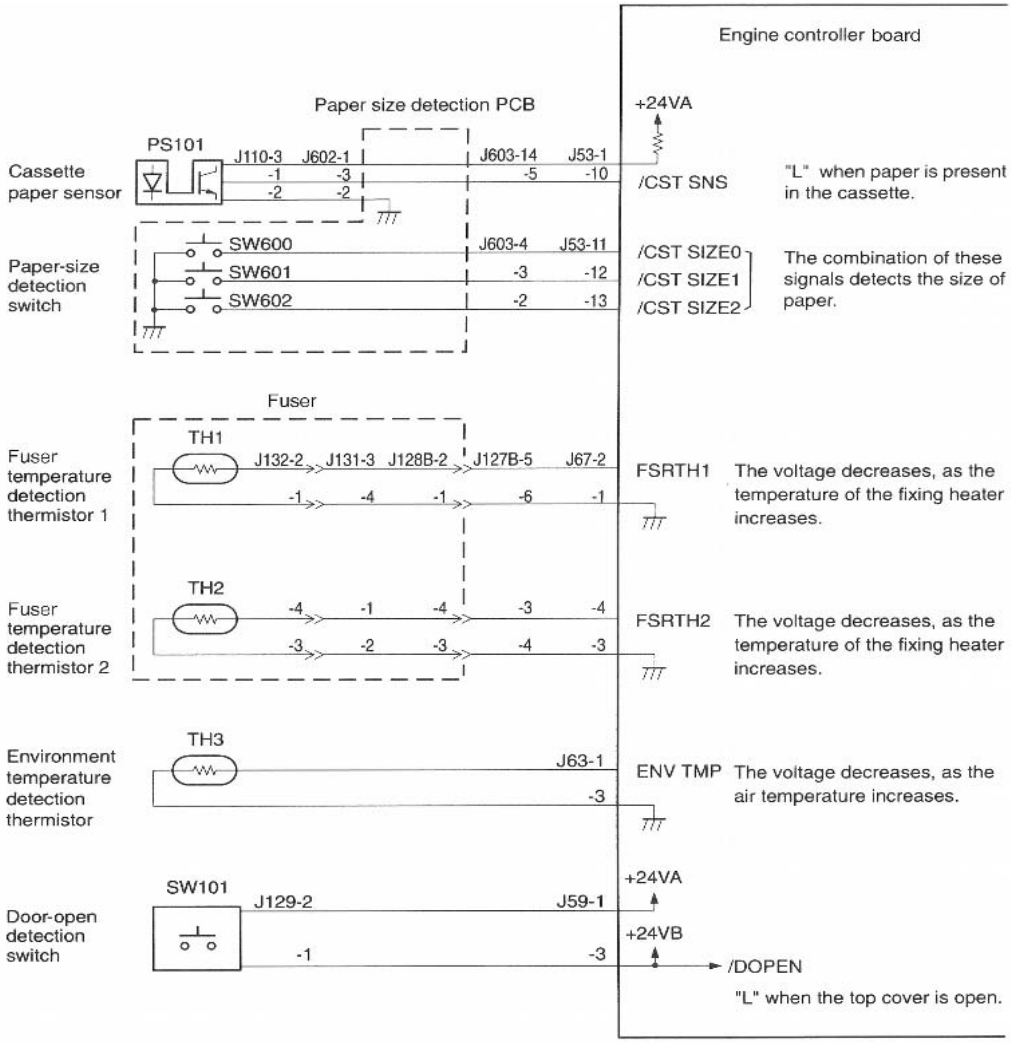

Figure 13. **Engine controller board I/O (2 of 5)**

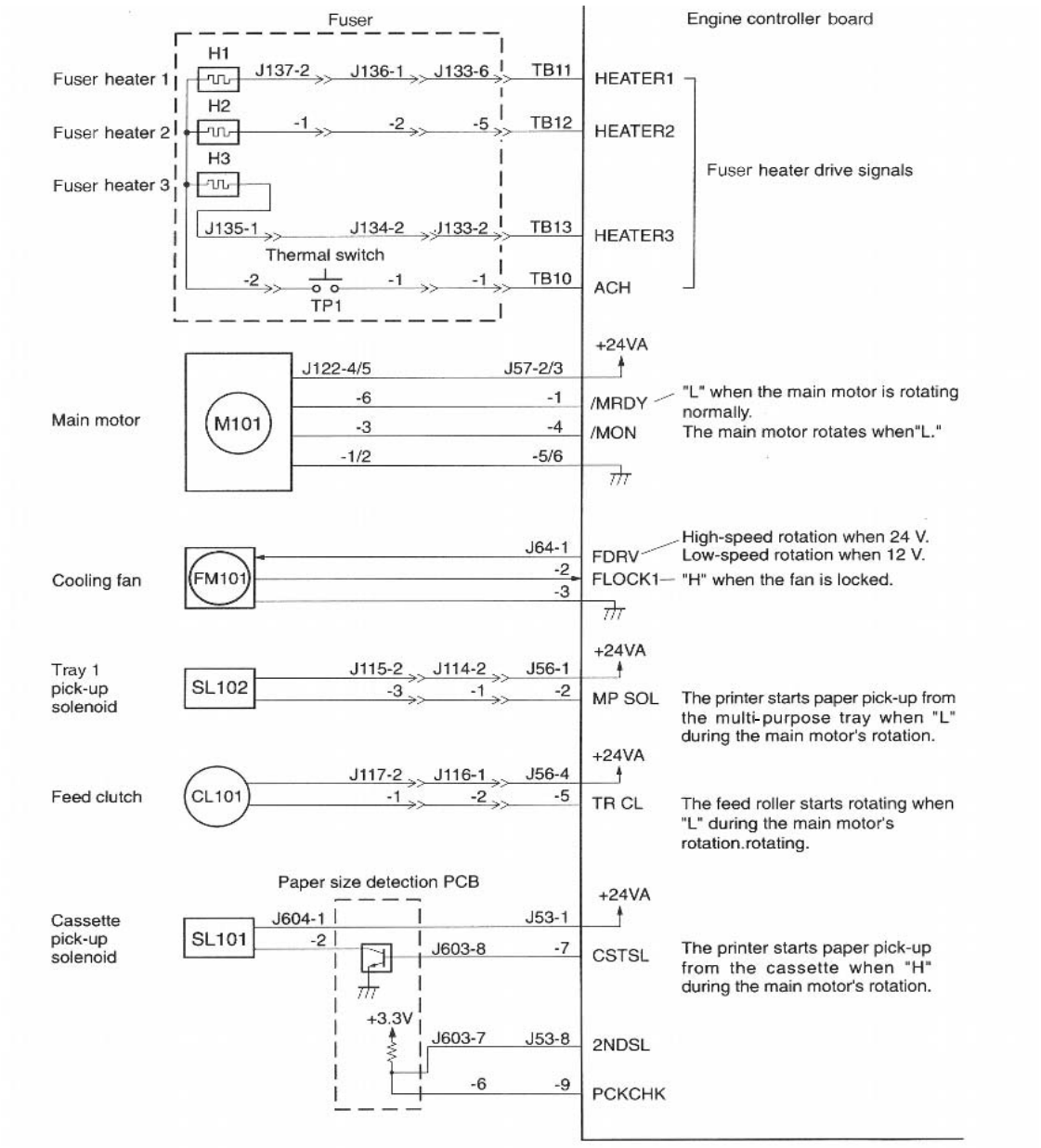

Figure 14. **Engine controller board I/O (3 of 5)**

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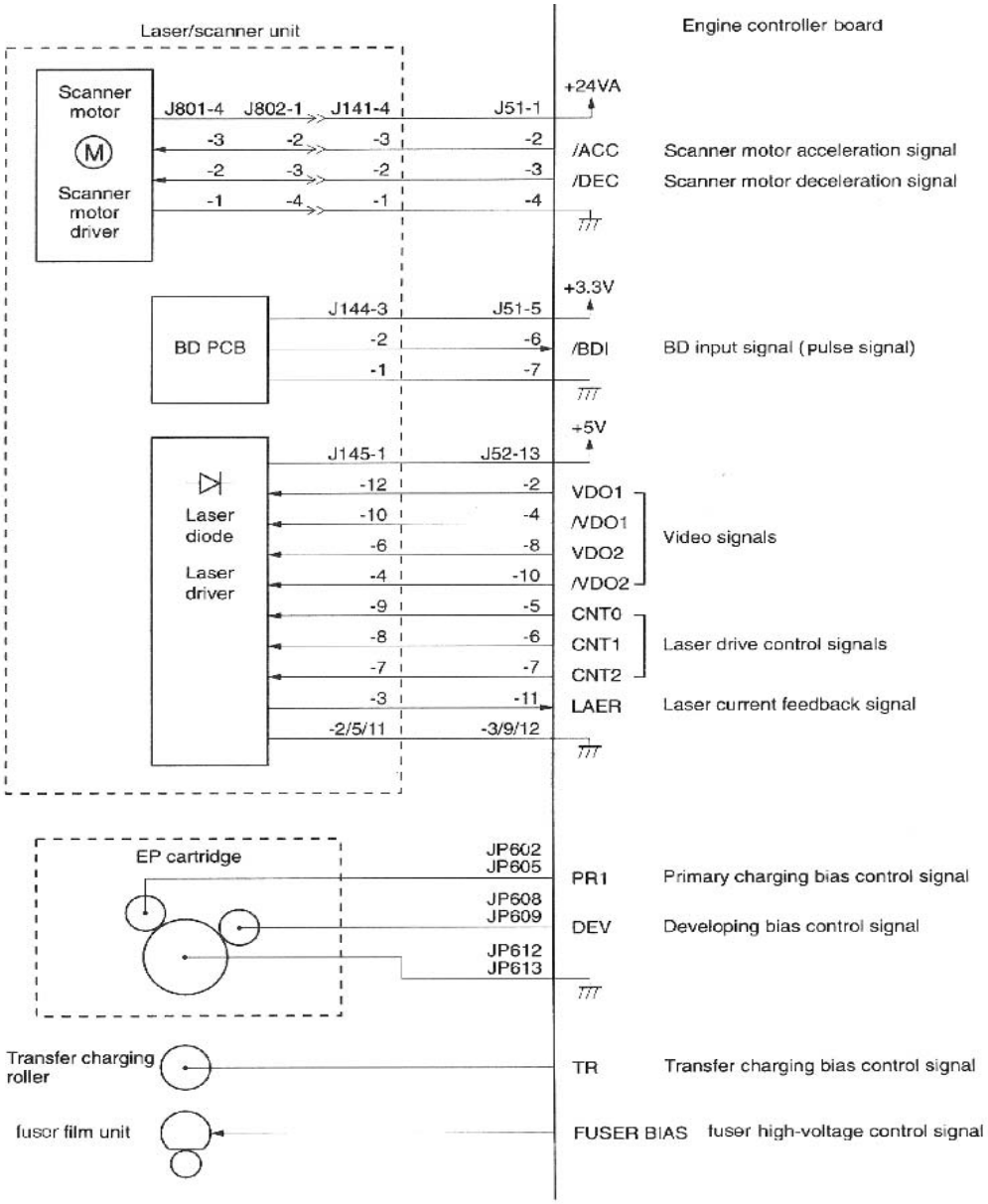

Figure 15. **Engine controller board I/O (4 of 5)**

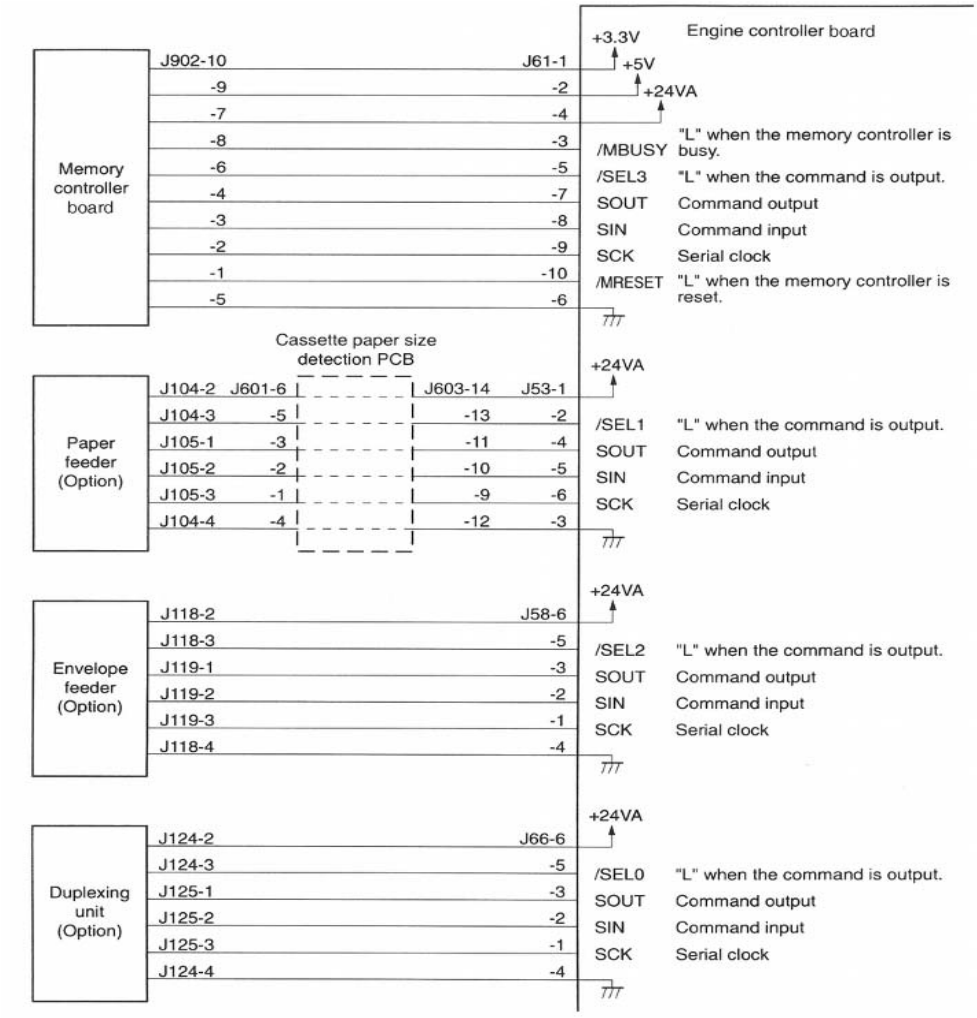

Figure 16. **Engine controller board I/O (5 of 5)**

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Laser/scanner drive

The HP LaserJet 4100 series printer has two diodes in the laser/scanner assembly. The printer uses a twin-beam method to scan two lines simultaneously. Based on information received from the formatter, the engine controller board sends signals to the laser scanner assembly to modulate the laser diodes on and off and to drive the laser scanner motor. See “Image formation system” on page 108 for more information.

Paper-motion monitoring and control

The engine controller board controls paper motion by continuously monitoring the various paper sensors and coordinating paper movement with the other print processes. For more information, see “Paper feed system” on page 117.

Solenoids, sensors, clutches, and switches

The engine controller board monitors the various sensors and switches in the printer and controls the solenoids and clutches for paper movement. See "Engine controller board inputs and outputs" on pages 96 through 100.

Engine test print

The engine controller board has a built-in engine test pattern that can be printed without using the data from the formatter. See “Engine test” on page 190 in chapter 7.

Motors

See “Timing diagram” on page 131 for specific timing details for the printer motors.

This printer and optional input trays are driven by the main motor, which is controlled by commands from the CPU.

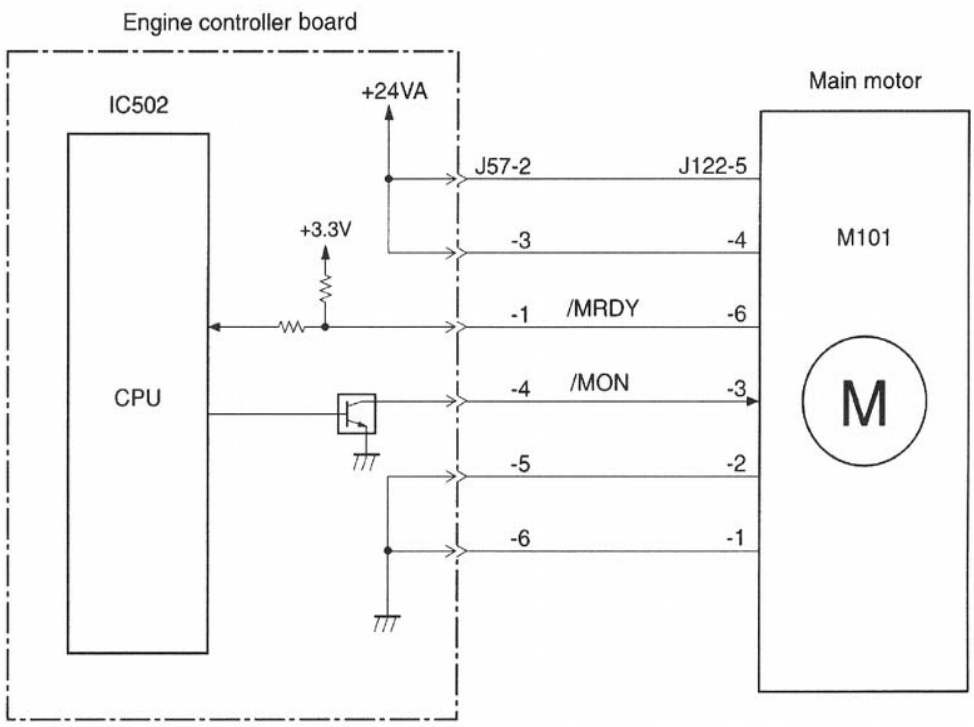

Figure 17. **Main motor control**

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The main motor is a DC brushless motor with hall elements, and is unified with the motor drive circuit.

The CPU (IC502) sets the main motor drive signal (/MON) to “L” and rotates the main motor. When the main motor rotates and reaches the specified speed, the main motor sets the main motor ready signal (/MRDY) to "L". When the /MRDY signal is "L," the CPU determines that the main motor is rotating correctly.

Note When the printer is idle, the main motor comes on every seven hours for 500 milliseconds.

If the printer is in the following conditions, the CPU determines a main motor failure.

- The /MRDY signal does not go to "L" after 700 ms from the main motor rotation start.
- During normal rotation, the /MRDY signal goes to "H" continuously for 0.1 second after going to "L".

The scanner motor is controlled and monitored by the engine controller board. It rotates the scanner mirror during the initial rotation period and the print period.

The fan motor is controlled and monitored by the engine controller board. The fan operates at full speed during the printing modes. During the wait period after the power is on, the fan motor prevents the temperature from rising in the printer.

Note While in idle or PowerSave mode, the fan motor comes on every 14 minutes and stays on for 6 minutes to cool the heat generated by the engine controller board and the power supply.

Formatter system

The formatter is responsible for the following:

- Controlling the PowerSave mode
- Receiving and processing print data from the various printer I/Os
- Monitoring control panel inputs and relaying printer status information (through the control panel and the bidirectional I/O)
- Developing and coordinating data placement and timing with the print engine
- Storing font information
- Communicating with the host computer through the bidirectional interface

The formatter receives a print job from the bidirectional interface and separates it into image information and instructions that control the printing process. The engine controller board synchronizes the image formation system with the paper input and output systems, and then signals the formatter to send the print image data.

The formatter also provides the electrical interface and mounting locations for two EIO cards, additional memory DIMMs, the hard-disk accessory, and the optional HP Fast Infrared Receiver.

PowerSave

This feature in the configuration menu conserves power after the printer has been idle for an adjustable period of time. When the printer is in PowerSave mode, the control panel backlight is turned off, but the printer retains all printer settings, downloaded fonts, and macros. The default setting is POWERSAVE=ON, with a 30-minute idle time. PowerSave can also be turned OFF from the resets menu on the control panel.

The printer exits PowerSave mode and enters the warm-up cycle when any of the following occurs:

- A print job, valid data, or a PML or PJL command is received at the parallel port, serial port, FIR port, or EIO card.
- A control panel key is pressed.
- The top cover is opened.
- A paper tray is opened.
- The engine test button is pressed.

Note Printer error messages override the PowerSave message. The printer will enter PowerSave mode at the appropriate time, but the error message will continue to appear.

Resolution Enhancement technology

The formatter contains circuitry for Resolution Enhancement technology (REt), which modifies the standard video dot data on its way to the engine controller board to produce “smoothed” line edges. The REt can be turned on or off from the control panel or from some software applications. The default setting is medium.

Note The REt settings sent from software applications or printer drivers override the control panel settings.

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EconoMode

The EconoMode setting uses up to 50 percent less toner than standard mode printing by reducing the dot density. However, EconoMode does not extend toner cartridge component life. EconoMode, which can be thought of as “draft mode,” can be selected from the control panel (print-quality menu) and through some software applications and printer drivers. The default setting is OFF.

CAUTION HP does not recommend full-time use of EconoMode. If EconoMode is used full-time, it is possible that the toner supply will outlast the mechanical parts in the toner cartridge.

Note EconoMode does not affect print speed or memory usage, or extend the life of the toner cartridge.

Input/output

Parallel interface

The formatter receives incoming data through its bidirectional interface (IEEE-1284). The I/O provides high speed and two way communication between the printer and the host, allowing the user to change printer settings and monitor printer status from the host computer. The user can configure the HIGH SPEED item in the control panel menu. The default setting, YES, allows the I/O to run at the higher speeds supported by most newer computers. When set to NO, the parallel interface runs at the slower mode that is compatible with older computers. The user can also configure the ADVANCED FUNCTIONS item. The default setting, ON, allows for two-way parallel communications. The OFF mode disables the advanced functionality. The I/O is compatible with the bidirectional parallel interface standard.

Expanded I/O

The optional expanded I/O (EIO) card can be installed in the slots provided on the formatter. It provides automatic I/O switching between multiple computers or networks connected to the printer.

HP Fast Infrared Receiver

The optional HP Fast Infrared Receiver enables wireless printing from any iRDA-compliant portable device (such as a laptop computer) to the printer.

The printing connection is maintained by positioning the sending infrared port within operating range. The connection can be blocked by objects such as a hand or paper, or by direct sunlight or any bright light shining into either infrared port.

Flash

Optional flash is available in 2 MB and 4 MB flash memory DIMMs for storing forms, fonts, and signatures.

Hard-disk accessory

The optional hard-disk accessory can be mounted in one of the EIO slots on the rear of the formatter. The optional EIO-based hard disk is used for creating multiple original prints (mopies) and storing forms, fonts, and signatures.

CPU

The HP LaserJet 4100 series printer formatter incorporates a 250 MHz RISC processor.

Printer memory

If the printer encounters difficulty managing available memory, a clearable warning message will appear on the control panel.

Some printer messages are affected by the auto-continue and clearable warning settings from the configuration menu on the printer control panel. If CLEARABLE WARNING=JOB is set on the control panel, warning messages appear on the control panel until the end of the job from which they were generated. If CLEARABLE WARNING=ON is set, warning messages appear on the control panel until Go is pressed. If an error occurs that prevents printing and AUTO CONTINUE=ON is set, the printer goes offline for 10 seconds before it returns online. If AUTO CONTINUE=OFF is set, the message appears until Go is pressed.

Read-only memory

Besides storing microprocessor control programs, the read-only memory (ROM) stores dot patterns of internal character sets (fonts).

Random-access memory

The random-access memory (RAM) contains the page, I/O buffers, and the font storage area. It stores printing and font information received from the host system, and can also serve to temporarily store a full page of print-image data before the data is sent to the print engine. Memory capacity can be increased by adding DIMMs to the formatter. Note that adding memory (DIMMs) might also increase the print speed for complex graphics.

DIMM slots

The DIMM slots can be used to add memory, fonts, or firmware upgrades.

Firmware DIMM

To upgrade printer firmware, insert a new firmware DIMM in the lowest DIMM slot inside the formatter assembly (see page 150).

Nonvolatile memory

The printer uses nonvolatile memory (NVRAM) to store I/O and information about the print environment's configuration. The contents of NVRAM are retained when the printer is turned off or disconnected.

Memory Enhancement technology

The HP Memory Enhancement technology (MEt) effectively doubles the standard memory through a variety of font- and data-compression methods.

Note The MEt is only available in PCL mode; it is not functional when printing in PS mode.

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PJL overview

Printer job language (PJL) is an integral part of configuration, in addition to the standard printer command language (PCL). With standard cabling, PJL allows the printer to perform functions such as:

- Two-way communication with the host computer through a bidirectional parallel connection. The printer can tell the host about such things as the control panel settings, and it allows the control panel settings to be changed from the host.
- Dynamic I/O switching allows the printer to be configured with a host on each I/O. The printer can receive data from more than one I/O simultaneously, until the I/O buffer is full. This can occur even when the printer is offline.
- Context-sensitive switching allows the printer to automatically recognize the personality (PS or PCL) of each job and configure itself to serve that personality.
- Isolation of print environment settings from one print job to the next. For example, if a print job is sent to the printer in landscape mode, the subsequent print jobs print in landscape only if they are formatted for landscape printing.

PML

The printer management language (PML) allows remote configuration and status readback through the I/O ports.

Control panel

The formatter sends and receives printer status and command data to and from a control panel board.

Image formation system

The image formation system is the main system in the printer. It consists of five stages:

1. Conditioning
2. Developing
3. Transferring
4. Fusing
5. Cleaning

When the formatter board sends the print signal to the engine controller board, it drives the main motor to rotate the photosensitive drum, the developing cylinder, the primary charging roller, the transfer charging roller, and the fuser pressure roller.

The primary charging roller places a uniform negative charge on the surface of the photosensitive drum. To form a latent image on the photosensitive drum, the laser beams modulated by the video signals are illuminated on the photosensitive drum surface.

The latent image formed on the photosensitive drum is changed to a visual image by the toner on the developing cylinder, then transferred to the paper by the transfer charging roller. Then the transferred toner is fused with heat and pressure in the fuser to be a permanent image on the paper. After that, the residual toner on the photosensitive drum surface is scraped off with the cleaning blade. Finally, the charge on the drum is made uniform by the primary charging roller to prepare for a new latent image.

The cartridge has a toner sensor that detects the remaining toner level and the presence of the cartridge.

If the toner in the cartridge becomes lower than the specified level or if there is no cartridge in the printer, it is reported to the formatter.

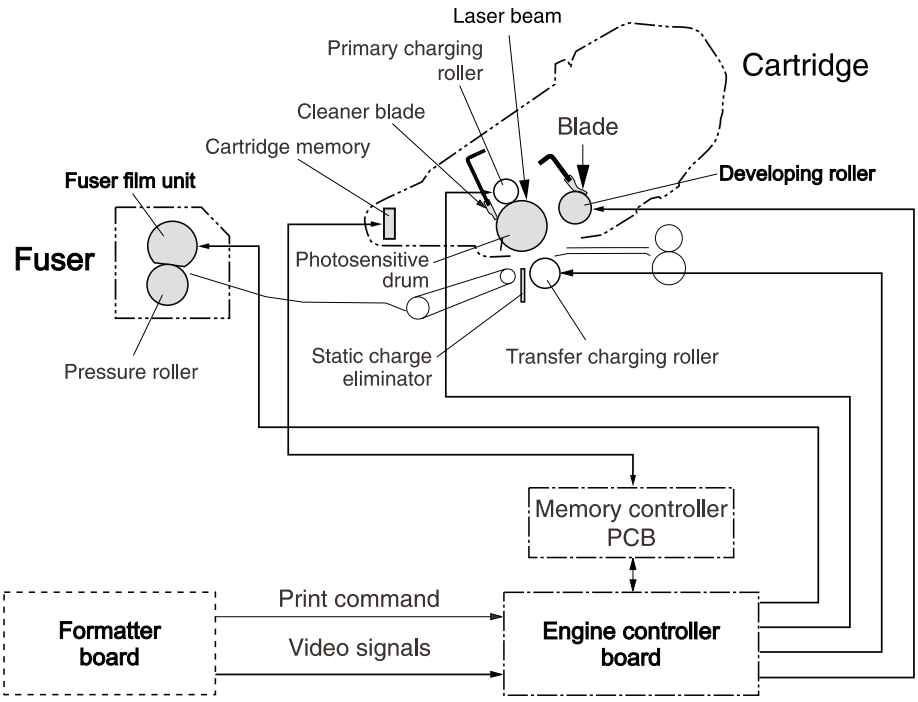

Figure 18. **Image formation system**

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Toner cartridge

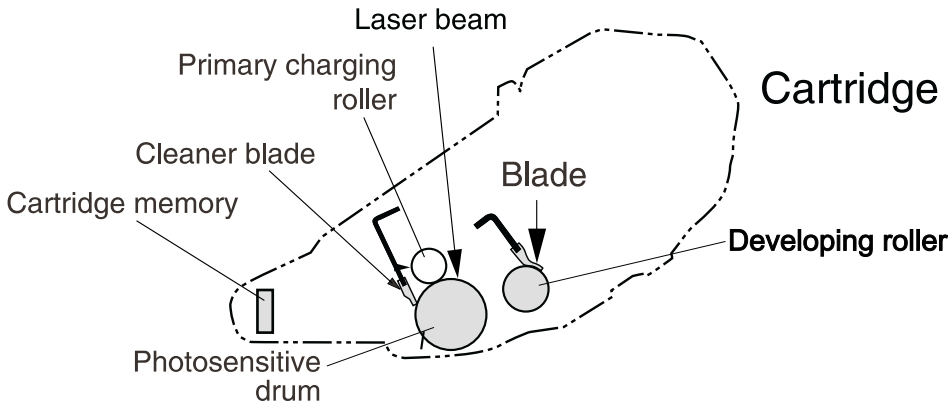

Figure 19. **Toner cartridge**

A major portion of the image formation system is contained in the cartridge as shown in figure 19.

The toner cartridge is the “heart” of the image formation system. It houses the cleaning, conditioning, and developing steps of the process. The toner cartridge contains the photosensitive drum, primary charging roller, developing roller, toner cavity, and cleaner blade. Including these components that wear, degrade, or are consumed in the replaceable toner cartridge eliminates the need for a service call when replacement is required.

Photosensitive drum

The special properties of the photosensitive drum allow an image to be formed on the drum surface and then transferred to paper. The drum is an aluminum cylinder coated with a layer of organic-photoconductive material (OPC) which is non-toxic. The OPC material has properties similar to a photoresistor. It becomes electrically conductive when exposed to light. (The negative charges deposited on the drum are conducted to the ground potential of the drum base.) Areas not exposed to light remain nonconductive and maintain their negative charge. The aluminum base of the photosensitive drum is electrically connected to ground potential.

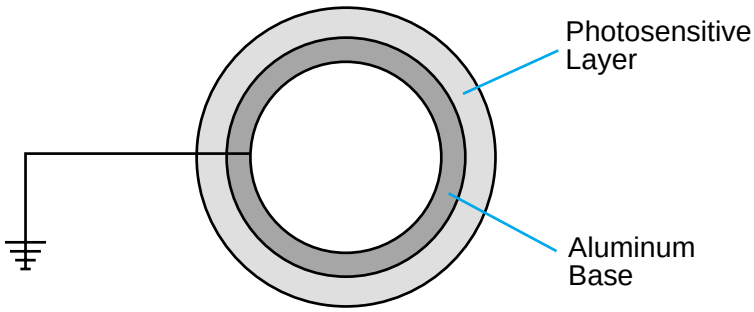

Figure 20. **Photosensitive drum**

Cleaning the drum

The cleaning blade is in contact with the surface of the drum at all times. As the drum rotates during printing, excess toner is scraped off and stored in the waste toner receptacle.

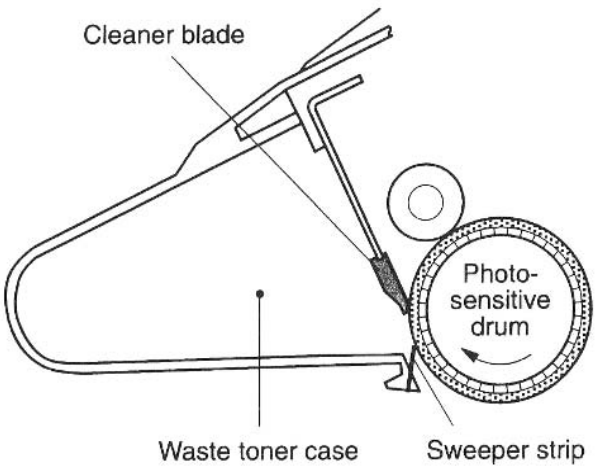

Figure 21. **Cleaning the drum**

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Conditioning the drum

The conditioning process consists of applying a uniform negative charge on the surface of the drum with the primary charging roller. The primary charging roller is coated with conductive rubber with an AC bias applied to erase any residual charges and maintain a constant drum surface charge. The amount of DC voltage is modified by the print density setting.

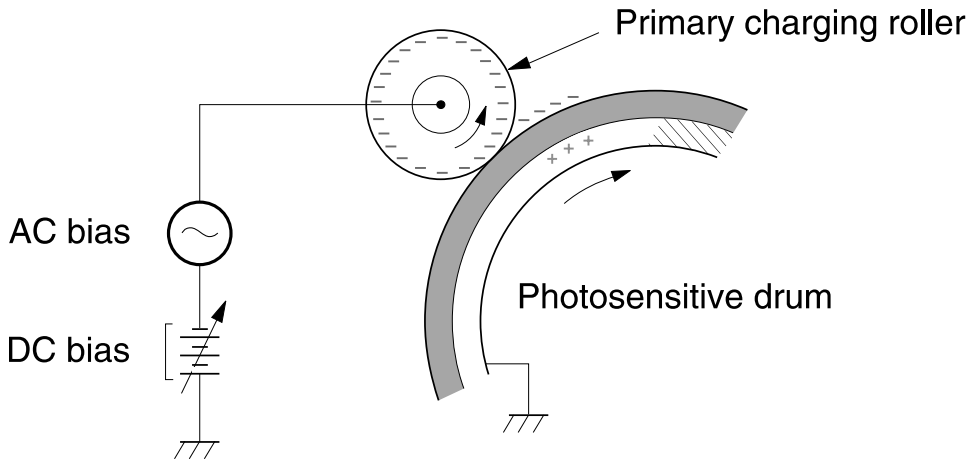

Figure 22. **Primary charging roller**

Writing the image

The laser/scanner of this printer has two diodes in the laser unit. During the writing process, the modulated laser diodes project two beams onto the rotating six-sided scanning mirror. As the mirror rotates, the beams reflect off the mirror, through a set of focusing lenses, through a slot in the top of the toner cartridge, and onto the photosensitive drum. The beams sweep the drum from left to right, discharging the negative potential wherever the beams strike the surface. This creates a latent electrostatic image, which later is developed into a visible image.

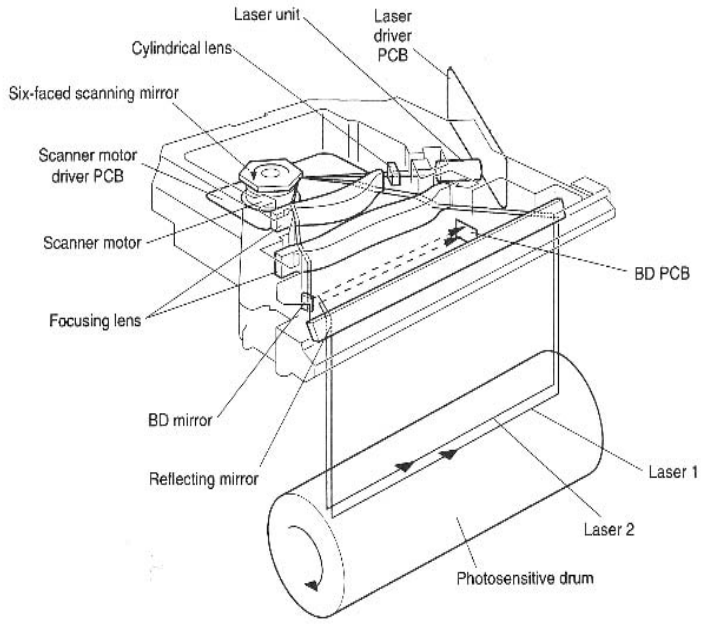

Figure 23. **Writing the image**

Because the beams are sweeping the entire length of the drum and the drum is rotating, the entire surface area of the drum can be covered. The speed of the scanner motor (which turns the scanning mirror) and the speed of the main motor (which turns the drum) are synchronized, and each successive sweep of a beam is offset by 1/1200th of an inch. The beams can be turned on and off to place a dot of light every 1/1200th of an inch. This is how the printer achieves its true 1200 by 1200 dpi resolution. After the writing process, the drum surface has an invisible (latent) electrostatic image.

At the beginning of each sweep, the beams strike the beam detect mirror and PCB, generating the beam detect signal (BD). The BD signal is sent to the engine controller board, where it is converted to an electrical signal used to synchronize the output of video data for one sweep (two scan lines) and to diagnose problems with the laser diode or scanner motor.

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Developing the image

The developing process develops the latent electrostatic image into a visible image on the drum. The developing unit consists of a metallic cylinder that rotates around a fixed magnetic core inside the toner cavity. Toner is a powdery substance made of black plastic resin bound to iron particles, which is uniformly attracted to the magnetic core of the cylinder.

The toner particles obtain a negative surface charge by rubbing against the developing cylinder which is connected to a negative DC supply. The negatively charged toner is attracted to the discharged (exposed, grounded) areas on the drum. An AC potential is applied to the developing cylinder to decrease the attraction between the toner and the magnetic core of the cylinder, and to increase the repelling action of the toner against the areas of the drum not exposed to laser light. This AC potential improves density and contrast.

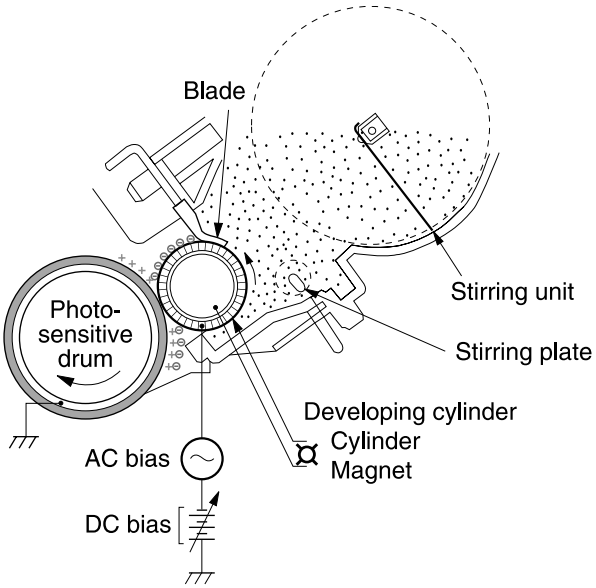

Figure 24. **Developing the image**

The print density control in the print quality menu adjusts the DC bias of the developing cylinder by changing the force of attraction between the toner and drum. A change in the DC bias causes either more or less toner to be attracted to the drum, which in turn either increases or decreases the print density. Both the primary and developer DC bias voltages are changed in response to the density setting.

Transferring the image

During the transferring process the toner image on the drum surface is transferred to the paper. A positive charge applied to the back of the paper by the transfer roller causes the negatively charged toner on the drum surface to be attracted to the page.

The small diameter of the drum, combined with the stiffness of the paper, causes the paper to peel away from the drum. The static eliminator teeth also help separate the paper from the drum. The static eliminator teeth weaken the attractive forces between the negatively charged drum surface and the paper. After separation, the drum is cleaned and conditioned for the next image.

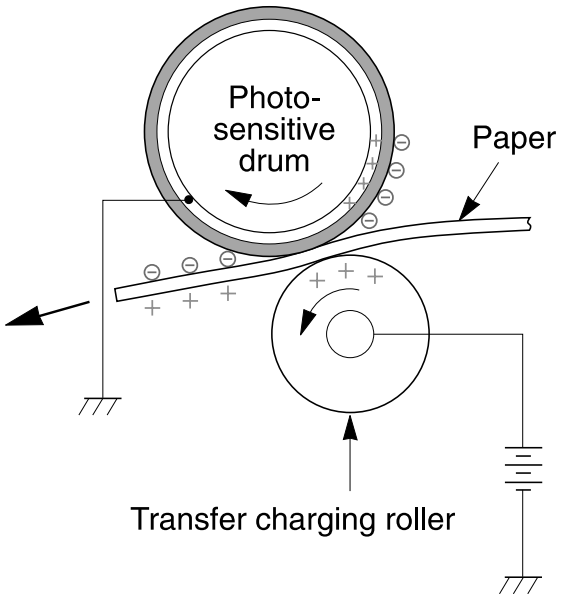

Figure 25. **Transferring the image**

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Image fusing/variable fusing temperature

During the fusing process, the toner is fused into the paper by heat and pressure to produce a permanent image. The paper passes between a heated fusing roller and a soft pressure roller. This melts the toner and presses it into the paper.

This printer utilizes an on-demand fusing method, which uses fusing film with small heat capacity. This method has fast temperature-rising time. It is not necessary to supply power to the fuser heater during the standby mode. Wait time is shortened and energy conservation is made possible by this method.

The fusing roller contains a ceramic strip that contains three heating elements, providing heat for the fusing process. Fusing temperature is monitored by the engine controller board using two thermistors. The engine controller board maintains a temperature of about 195° C (383° F) during print mode. If the fusing system overheats (about 240° C/464° F), a relay opens, interrupting power to the fusing heater and causing a fuser error message (`50.X FUSER ERROR`). If the fusing system exceeds 250° C (482° F), the thermal fuse will open, cutting off power to the fuser.

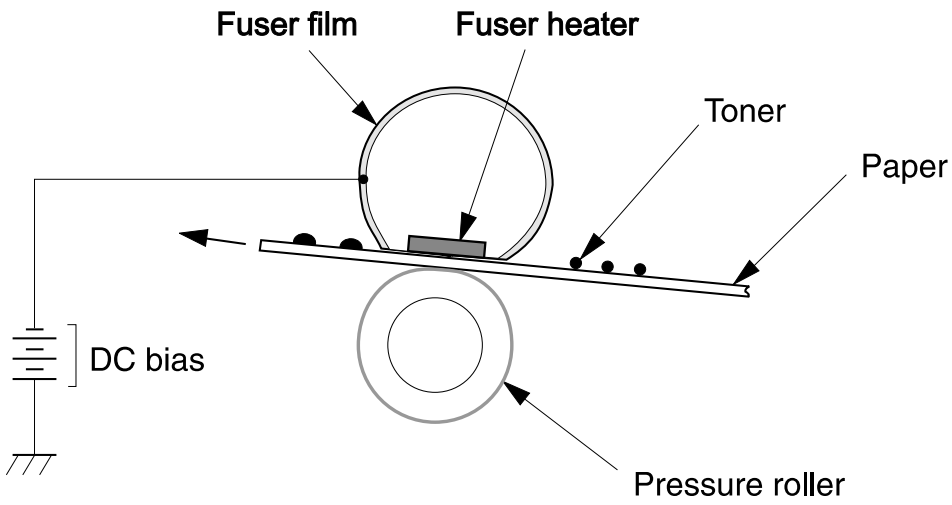

Figure 26. **Image fusing**

Variable fusing temperature

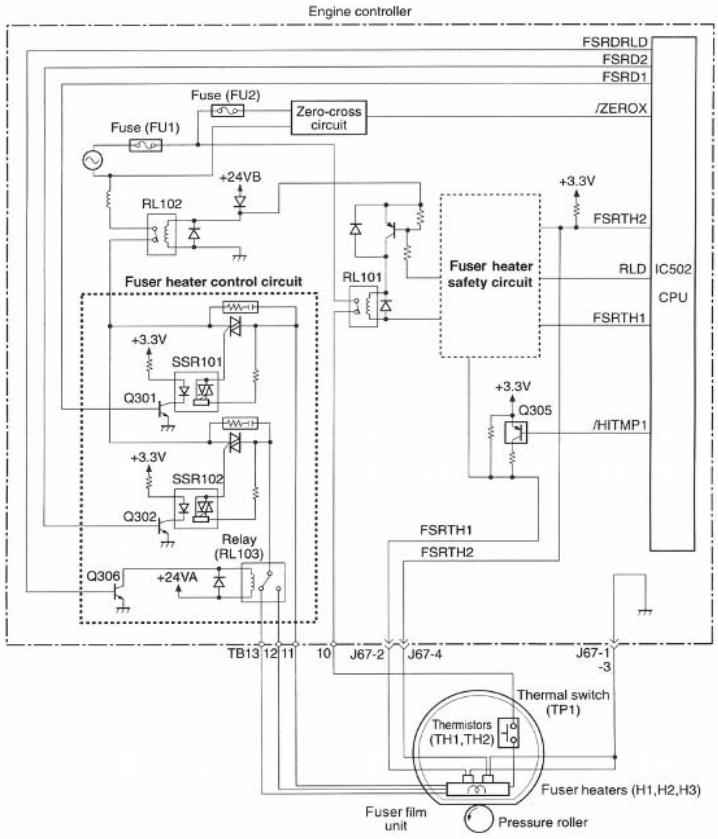

Figure 27. **Fusing temperature control**

Variable fusing temperature is a feature that gives the user or service technician the ability to adjust the fusing temperature based on the media being used in the printer. The default mode is normal and should be optimal for most users. There are optional fuser-mode selections. If very heavy or rough media is being used, then high fuser mode is beneficial. If transparencies or light media are being used, then low fuser mode might be appropriate. `CONFIGURE FUSER MODE` is in the paper-handling menu and when set to the default of `NO`, paper types are not displayed in the menu. When `CONFIGURE FUSER MODE` is set to `YES`, the different paper types are displayed in the menu (see page 59).

Note High2 fusing mode only operates for A4-, letter-, and legal-size paper, and slows the throughput to 16 pages per minute.

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Paper feed system

The printer in figure 29 on page 119 has two standard paper sources: the 100-sheet tray (tray 1) and the 500-sheet tray (tray 2). Up to two additional optional paper trays can be included.

Both the size of the paper in the tray and the presence of a tray are detected by the three switches (SW600, 601, 602) on the paper size detection circuit assembly.

All of the rollers on the paper path are driven by the main motor (M101). While the main motor rotates, the tray pickup solenoid is turned on, the tray pickup roller rotates, and a sheet of print media is fed into the printer. Then, the sheet passes the registration assembly, which compensates for the skew of the sheet.

After the top of page sensor (PS103) detects the leading edge of the sheet, the vertical synchronization signal (/TOP) is sent from the engine controller board to the formatter.

After the formatter receives the /TOP signal, the /VDO signal is sent; this synchronizes the leading edge of the image on the drum with the leading edge of the sheet. The sheet of print media goes through transfer, separation, and fusing stages; passes through the delivery unit; and is delivered to the top output bin or rear output bin.

There are five photosensors (PS102, PS103, PS106, PS107, PS108) in the paper path that detect the presence of media. If a sheet does not reach or pass these sensors within a prescribed time interval, the microprocessor on the engine controller board detects a jam.

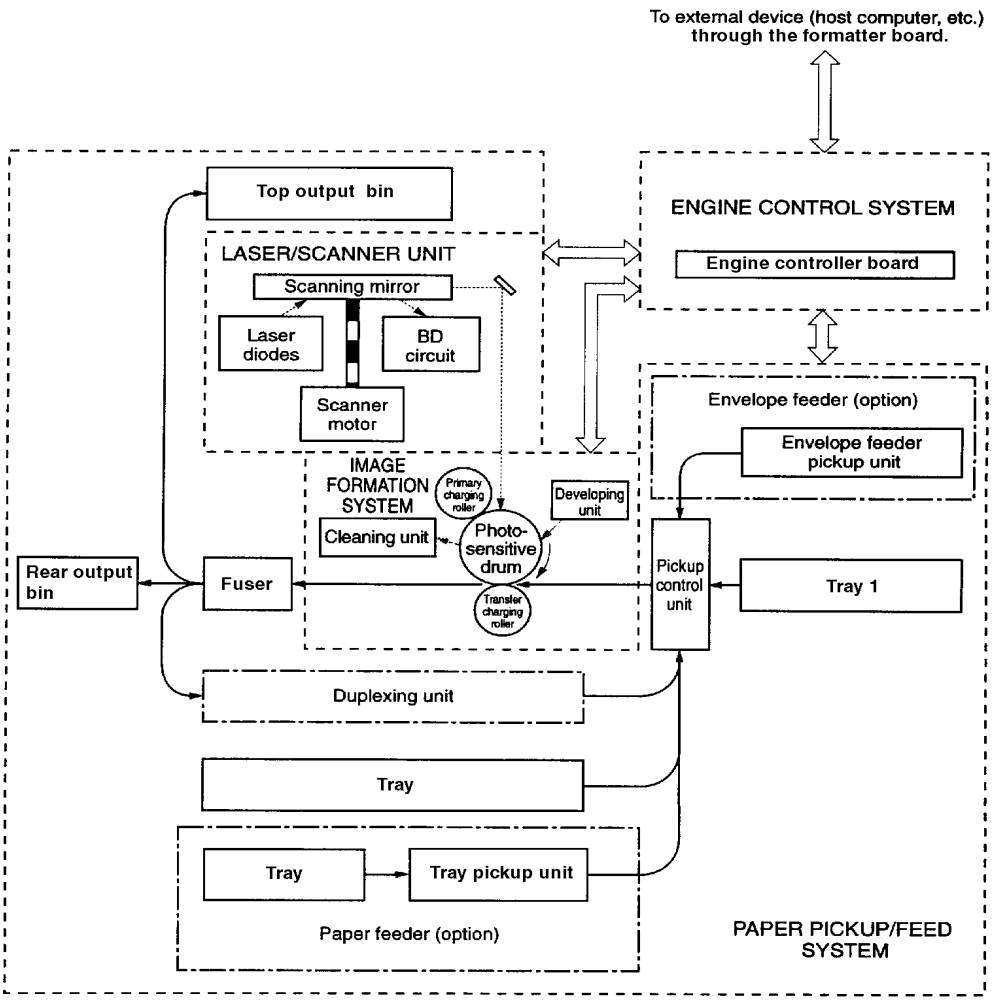

Figure 28. **Paper feed subsystem**

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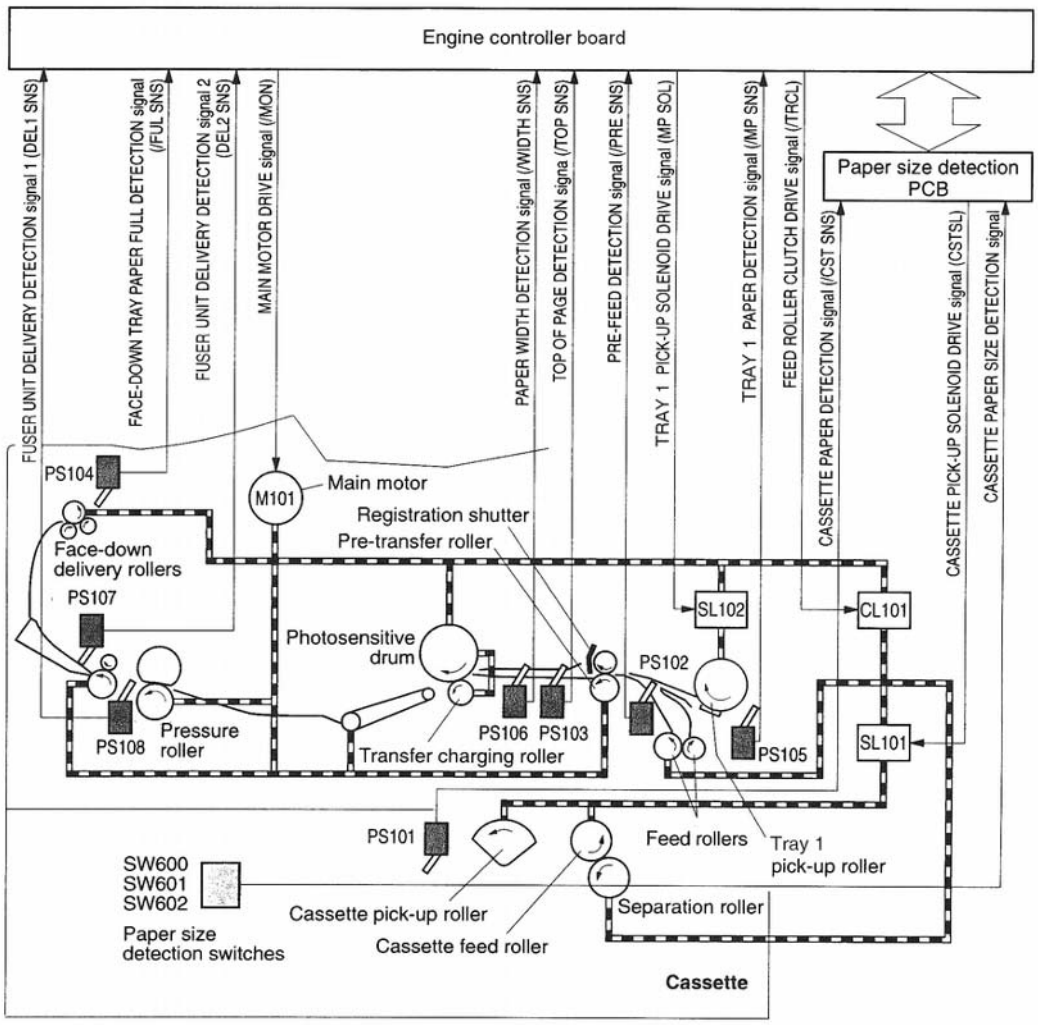

Figure 29. **Paper path**

Clutches and sensors

See chapter 7 for locations of switches, sensors, and clutches.

Printing from tray 1

The presence of paper in tray 1 is detected by the tray 1 paper sensor (PS105).

When the engine controller board receives the /PRNT signal from the formatter, the printer starts the initial rotation phase. (This consists of main motor warm-up, scanner motor warm-up, high-voltage control sequence and fuser warm-up.) When the initial rotation phase ends, the tray 1 pickup solenoid (SL102) is activated.

The cam rotates, the paper tray lifter rises, and the media comes in contact with the tray 1 pickup roller. At the same time, the tray 1 pickup roller rotates twice and a sheet of media in tray 1 is picked up. The lifter plate prevents unnecessary sheets from feeding with the first sheet.

The sheet then reaches the registration assembly, where its skew is corrected. Then it goes through transfer, separation, and fusing stages; passes through the delivery unit; and is delivered to the output bin.

Note If paper is removed from tray 1 just before it is picked, the tray 1 pickup roller might continue to rotate up to six times and a jam will be detected.

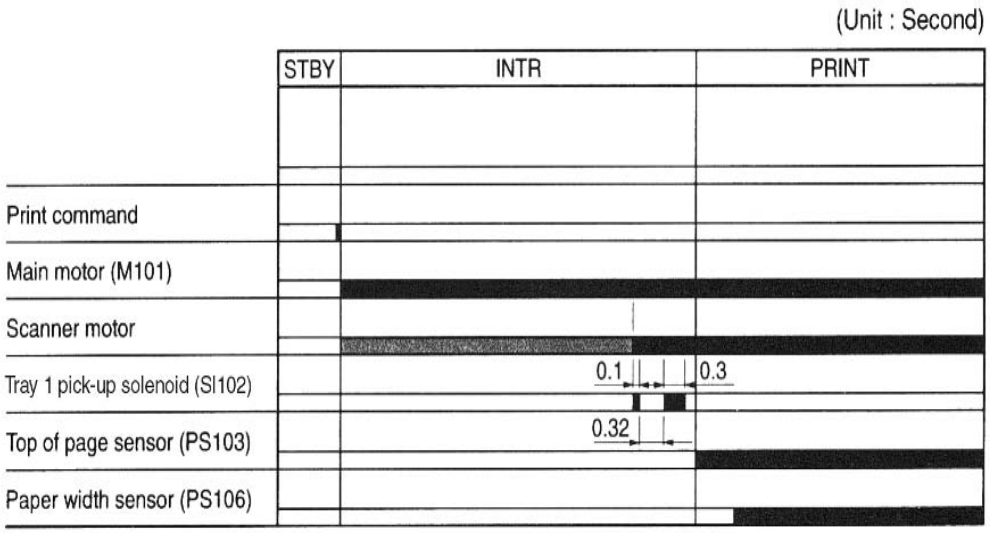

Figure 30. **Tray 1 pickup timing**

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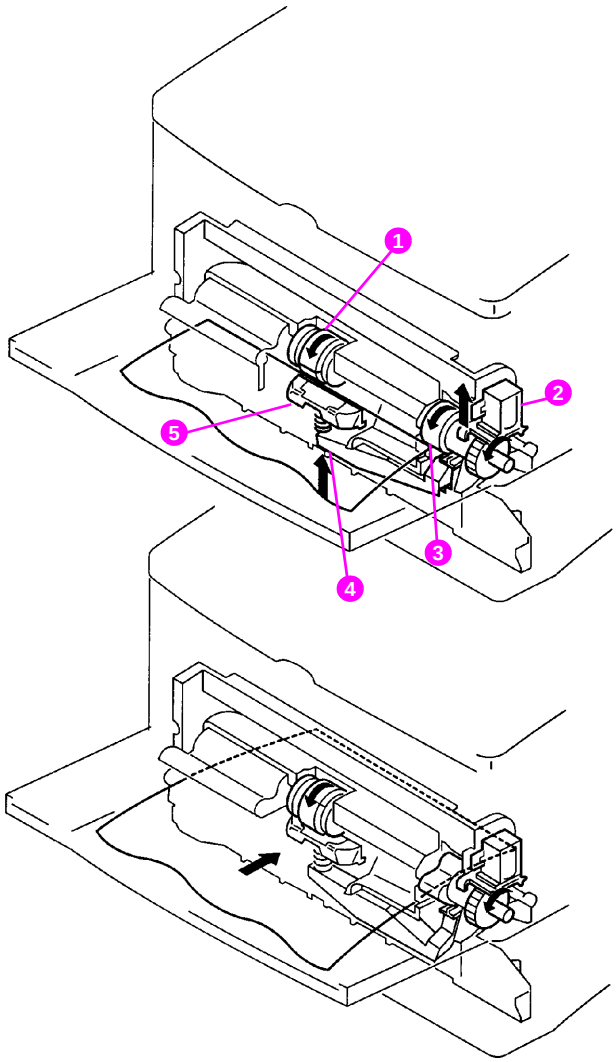

Figure 31. **Tray 1 pickup**

1 Tray 1 pickup roller

2 Tray 1 pickup solenoid

3 Cam

4 Lifter arm

5 Lifter plate

Printing from tray 2

When the formatter sends the /PRNT signal to the printer, the main motor (M101) and scanner motor start rotation. When the main motor reaches its prescribed speed, the feed roller clutch (CL101) and tray 2 pickup solenoid (SL101) are activated. (The tray 2 pickup roller, tray 2 feed roller, tray 2 separation roller, and paper feed rollers are driven by the main motor rotation.)

The tray 2 pickup roller, activated by the pickup solenoid, rotates once and picks up the media in the tray. The unnecessary sheets are removed by the separation roller and the media is fed to the pre-feed sensor (PS102).

The sheet then reaches the registration assembly, where its skew is corrected. Then it goes through transfer, separation, and fusing stages; passes through the delivery unit; and is delivered to the output bin.

Note If paper is removed from tray 1 just before it is picked, the tray 1 pickup roller might continue to rotate up to six times and a jam will be detected.

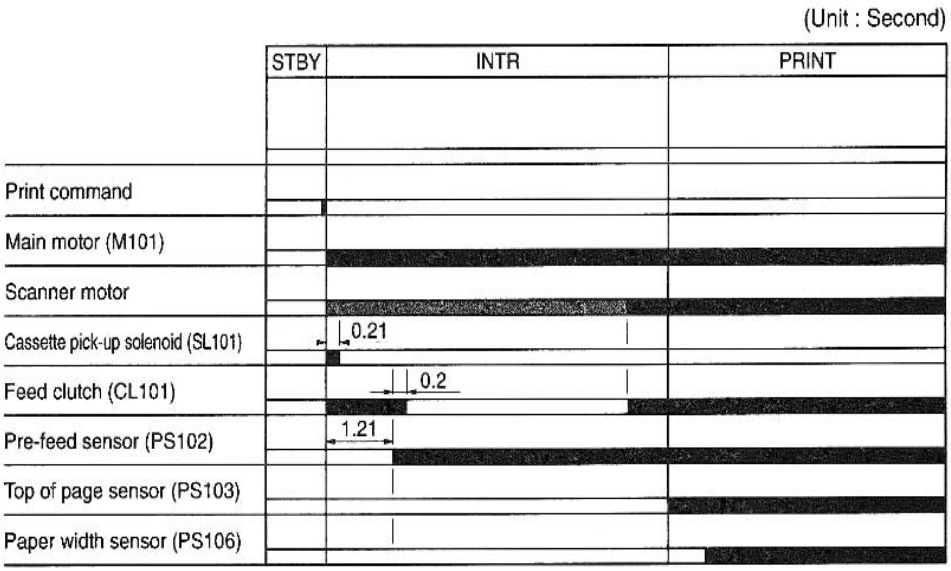

Figure 32. **Tray 2 pickup timing**

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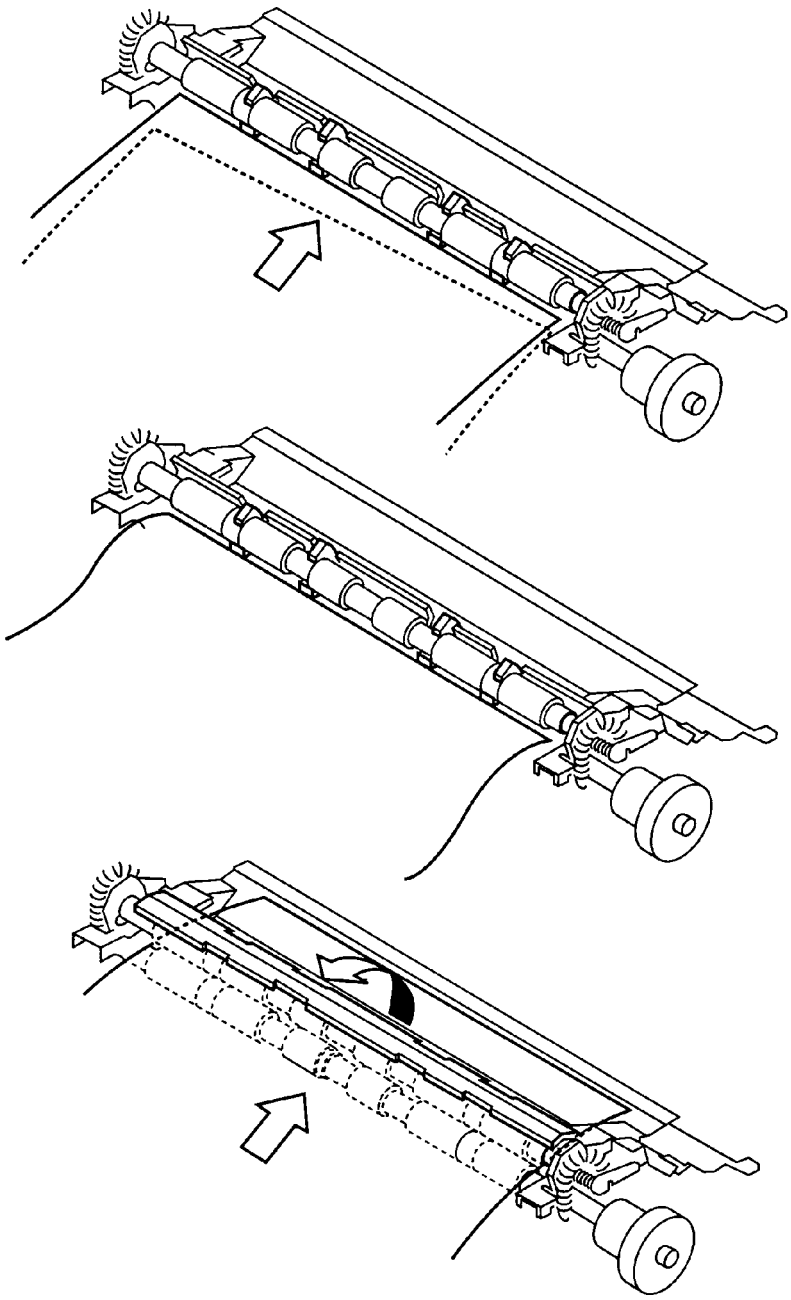

Figure 33. **Skew correction at registration assembly**

Multiple-feed prevention mechanism

The printer uses the separation roller in tray 2 to prevent multiple-feeding. Normally, the separation roller rotates in the same direction as the feed roller. The separation roller is equipped with a torque limiter, but because the force of the feed roller exceeds that of the torque limiter, the separation roller is actually driven by the feed roller.

If multiple sheets of media are picked up, however, the low friction force between the sheets weakens the rotational force from the feed roller to the separation roller. Consequently, the torque limiter takes control of the separation roller, and rotates the separation roller in the reverse direction, which removes the extra sheets.

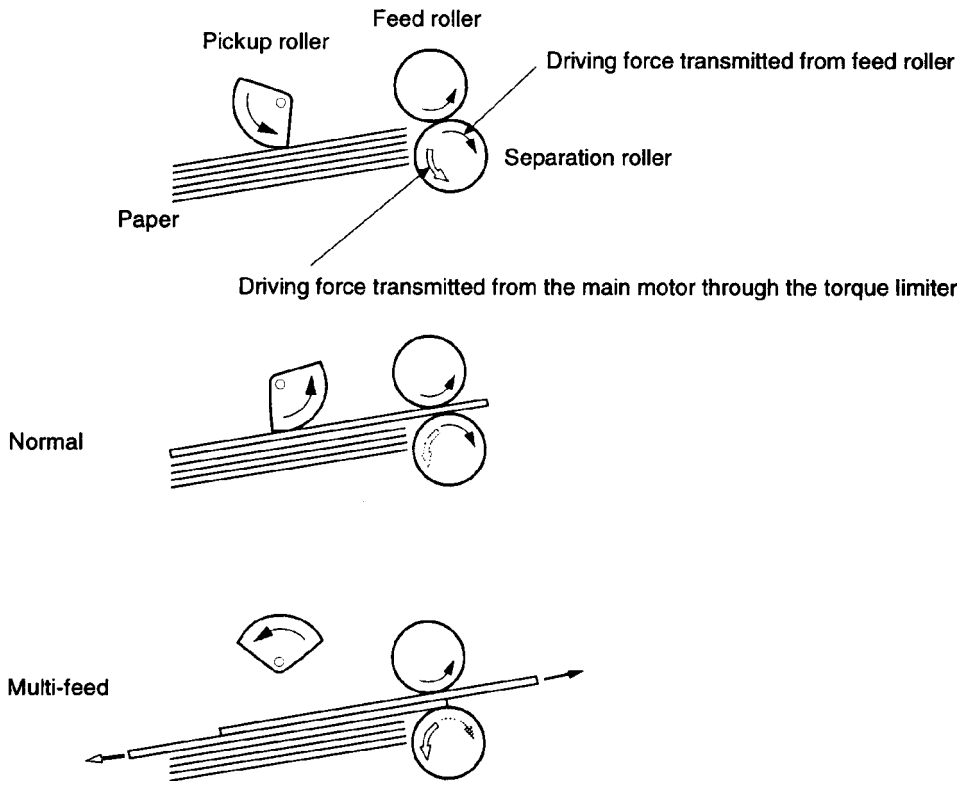

Figure 34. **Multiple-feed prevention mechanism**

Printing from the optional 500-sheet tray

Note The HP LaserJet 4100 series printers support up to two optional 500-sheet feeders.

The operation sequences of the paper feeder are controlled by the paper-feeder driver. A 4-bit microprocessor is used in the paper-feeder driver, which controls the paper feeder sequences and the communication with the engine controller board. The engine controller board sends the pickup command to the paper-feeder driver with the necessary timing.

The paper-feeder driver drives the solenoid in response to the pickup command. The paper-feeder driver also returns the status of the paper feeder to the engine controller board.

A charge of +24 VDC is supplied to the paper feeder from the printer, and +3.3 V for the integrated circuits is generated from +24 VDC inside the paper-feeder driver.

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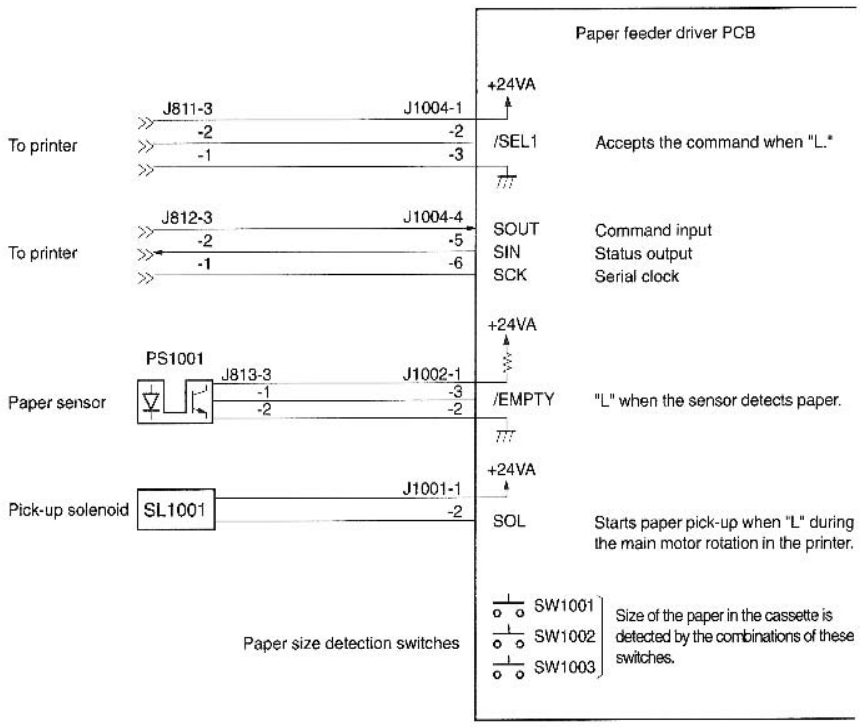

Figure 35. **Paper-feeder driver I/O**

Pickup and feeding

The media size and the presence of the 500-sheet tray are detected by three switches (SW1001, 1002, 1003) on the paper-feeder driver. The relationship between the switch combinations and the paper sizes is the same as for the printer.

The paper feeder is driven by the main motor (M101) of the printer. When a print command is sent to the paper feeder from the formatter, the main motor of the printer starts rotation. When the main motor reaches its prescribed speed, the paper-feeder driver receives the pickup command from the engine controller board, and the paper-feeder pickup solenoid (SL1001) is activated. (The pickup roller, feed roller, and separation roller are driven by the main motor's rotation.)

The pickup roller, activated by the solenoid, rotates once, picking up the media inside the 500-sheet tray. Any unnecessary sheets are removed by the separation roller and the media is fed to the prefeed sensor (PS102) of the printer.

The sheet then reaches the registration assembly, where its skew is corrected. Then it goes through transfer, separation, and fusing stages; passes through the delivery unit; and is delivered to the output bin. (For more information, see the graphic on page 252 in chapter 7.)

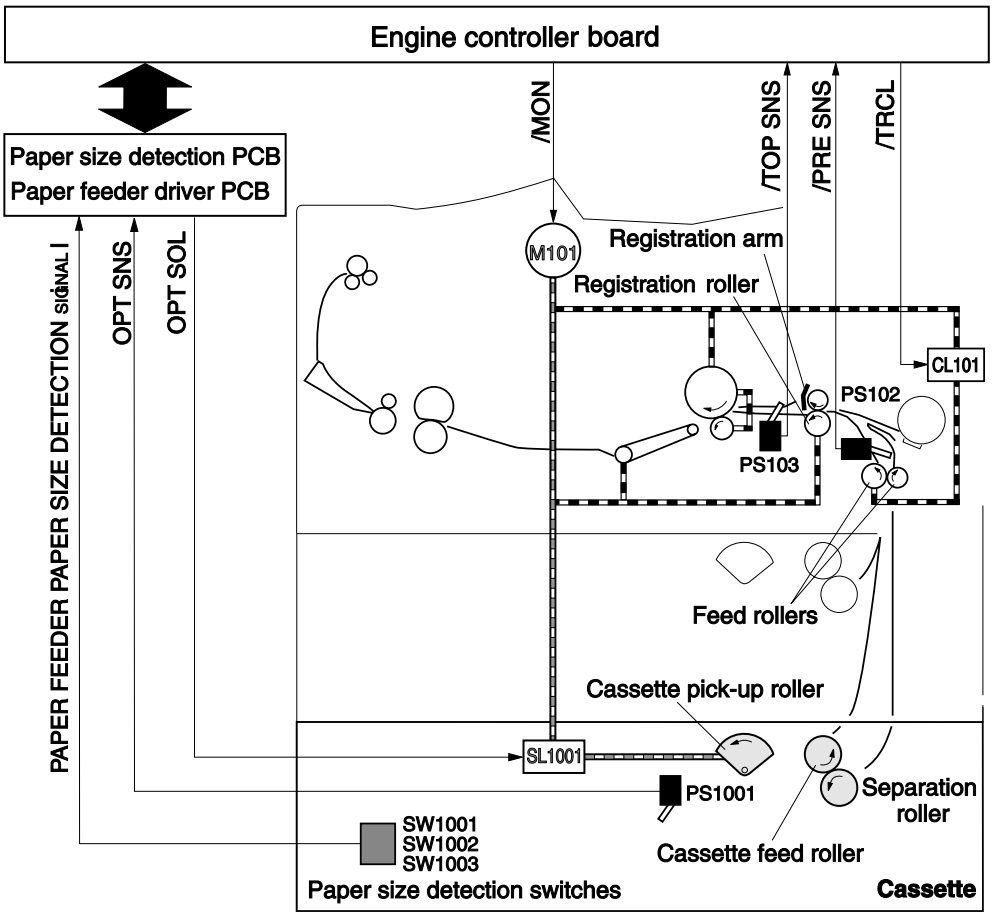

Figure 36. **Paper feed pickup**

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Envelope feeder

The operation sequences of the envelope feeder are controlled by the envelope-feeder driver. A 4-bit microprocessor is used in the envelope feeder driver, which controls the envelope-feeder sequence and the communication with the engine controller board of the printer.

The engine controller board sends the pickup command to the envelope-feeder driver with the necessary timing. The envelope-feeder driver activates the solenoid in response to the command. The envelope feeder driver also sends the envelope-feeder status to the engine controller board.

A charge of +24 VDC is supplied to the envelope feeder from the printer, and +3.3 V for the ICs is generated from the +24 VDC inside the envelope-feeder driver.

Pickup and feeding

In the envelope feeder, the envelope sensor (PS901) detects the presence of envelopes and the envelope-size sensor (PS903) detects if the envelope size is wide or narrow. All of the rollers in the envelope feeder are driven by the envelope pickup motor (M901).

When a print command is sent to the printer from the formatter, the printer starts the main motor (M101). When the initial rotation phase is completed, the scanner motor starts rotating. As the scanner motor rotates, the envelope pick-up motor starts rotating to drive the pickup roller, feed roller, and separation roller, and an envelope is picked up.

Then, any unnecessary envelopes are stopped by the separation roller, and the envelope is fed to the printer. The envelope then reaches the registration assembly, where its skew is corrected. Then it goes through transfer, separation, and fusing stages; passes through the delivery unit; and is delivered to the output bin. See figure 104 on page 252.

Duplexer

The operation sequences of the duplexer are controlled by the duplexer driver. A 4-bit microprocessor is used in the duplexer driver, which controls the duplexer sequence and the communication with the engine controller board.

The duplexer driver drives the solenoid, motors, and fan according to commands sent from the engine controller board to the duplexer and duplex pickup command via serial communication. The duplexer also returns its status to the engine controller board.

A charge of +24 VDC is supplied to the duplexer from the printer, and +5 V for the ICs is generated from the +24 VDC inside the duplexer driver.

Reversing and duplexer pickup

The duplexer has two stepping motors, the reversing motor (M701) and the duplex feed motor (M702). Normal and reverse rotations are controlled by the duplexer driver.

Print media is fed to the duplexer from the face-up output tray divertor, which is controlled by the duplexer solenoid.

Note If the face-up tray is open, the duplexer cannot be used.

When the trailing edge of the media passes the reverse sensor (PS703), the reversing motor changes direction. The media is then transported by the oblique roller and feed roller so that its edge makes contact with the left panel to correct its skew.

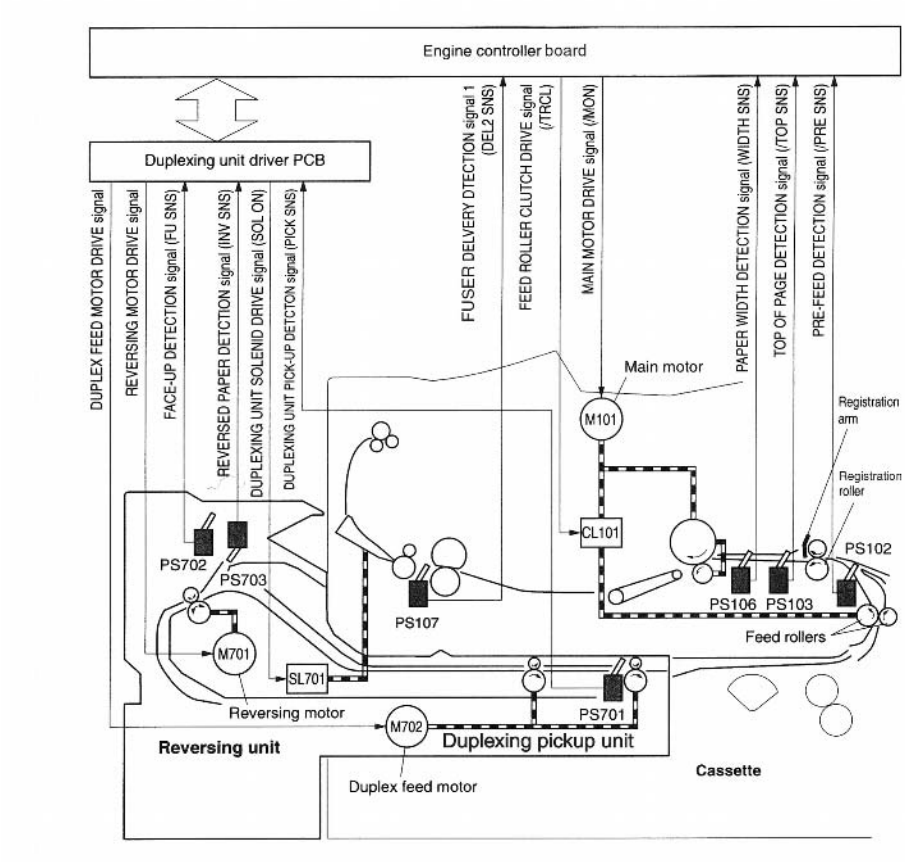

Figure 37. **Paper path for the duplexer**

Jams

The following paper sensors are installed to detect whether or not the print media is present and whether or not it is fed normally.

- Tray 2 paper sensor (PS101)
- Prefeed sensor (PS102)
- Top-of-page sensor (PS103)
- Face-down tray paper-full sensor (PS104)
- Tray 1 (multi-purpose tray) paper sensor (PS105)
- Paper width sensor (PS106)
- Fuser delivery sensor 1 (PS108)
- Fuser delivery sensor 2 (PS107)

The microprocessor (CPU) on the engine controller board detects a jam by checking for media presence in the sensor unit at the check timing stored in the memory.

If the CPU detects that a jam has occurred, it stops print operation and signals the formatter.

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Environmental detection

This printer is capable of detecting the ambient environment using the environment temperature sensor (TH3). The sensor, installed on the left side of the printer, measures the air temperature.

The CPU detects the air temperature with the voltage of ENVTMP signal and recognizes the ambient environment as one of the following three conditions:

- Low temperature: air temperature is 17° C (63° F) or lower
- Normal temperature: air temperature is 17° to 31° C (63° to 88° F)
- High temperature: air temperature is 31° C (88° F) or higher

This printer switches the temperature control for the fuser according to the ambient environment.

When the voltage of the ENVTMP signal becomes abnormally low-temperature (TH3 short) or abnormally high-temperature (TH3 open), the CPU detects an environment temperature sensor failure.

Basic sequence of operation

The operation sequences of this printer are controlled by the microprocessor on the engine controller board. The purposes of periods from power on until the main motor stops after the completion of printing are described below.

Table 33. Printer timing

Period	Timing	Purpose
WAIT	From power on until the main motor completes the initial rotation.	Clears the drum surface potential and cleans the transfer roller. During this period, the printer checks the toner level and the presence of the cartridge.
STBY (standby)	From the end of the WAIT or the LSTR period until the input of the PRNT signal from the formatter. Or from the end of the LSTR period until power off.	Maintains the printer in ready state.
INTR (initial rotation)	From the input of the PRNT signal from the formatter until the engine controller sends the TOP signal.	Stabilizes the photosensitive drum sensitivity in preparation for printing. Also cleans the transfer roller.
PRNT (print)	After the end of initial rotation until the top of the page sensor detects the trailing edge of the print media.	Forms images on the photosensitive drum based on the video signals from the formatter and transfers the image to the print media. During this period, the printer checks the toner level.
LSTR (last rotation)	After the primary voltage (DC) turns off until the main motor stops. If another PRNT signal is sent from the formatter, the printer returns to the INTR period. If not, it returns to the STBY period.	Delivers the last sheet of print media and cleans the transfer roller.

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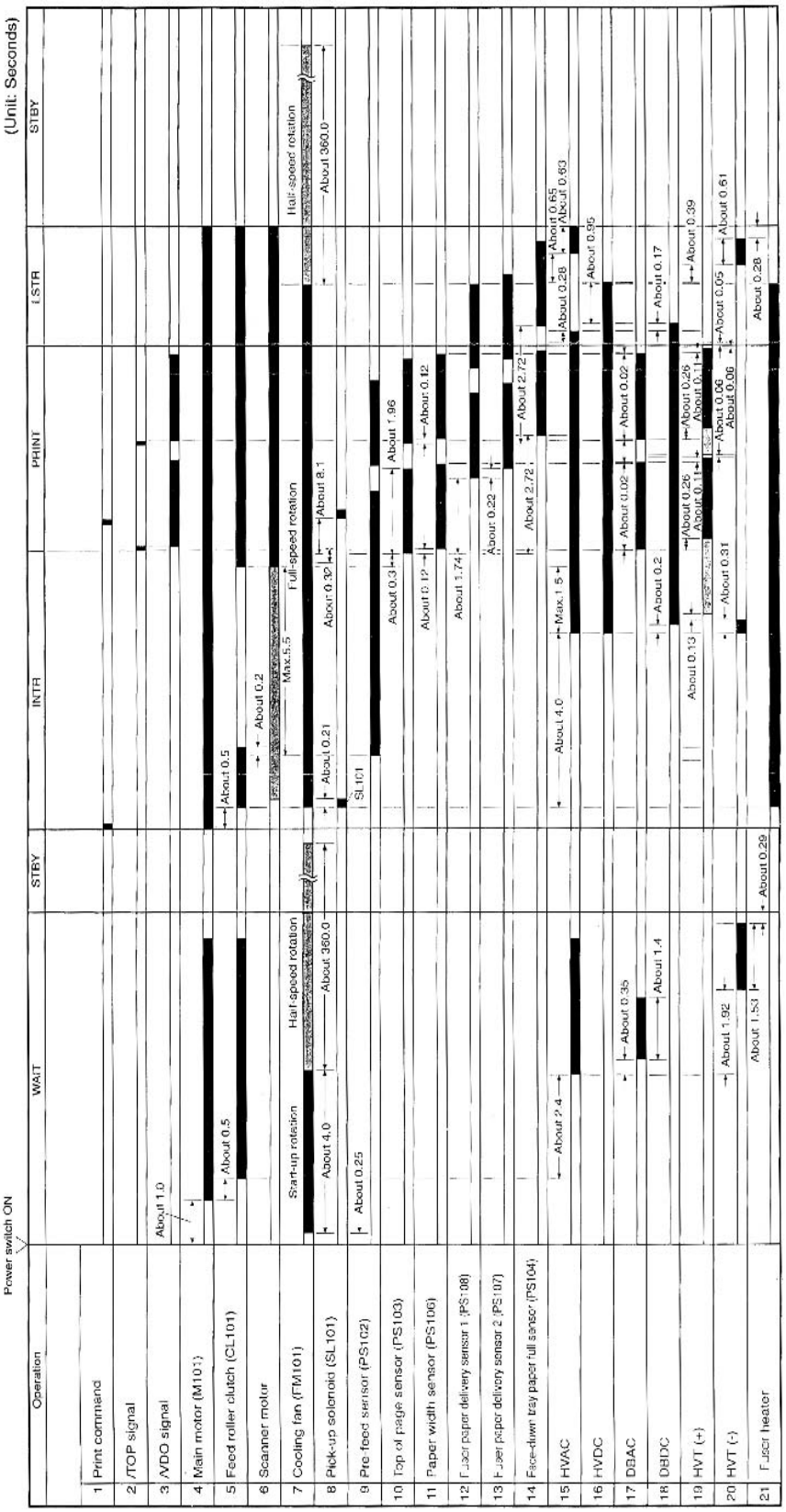

Figure 38. **Timing diagram**

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6 Removing and replacing parts

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Removal and replacement strategy

This chapter describes how to remove and reassemble major assemblies.

Replacement is generally the reverse of removal. Occasionally, hints and notes are included to provide direction for difficult or critical replacement procedures.

WARNING! Unplug the power cord from the power outlet before attempting to service the printer. If this warning is not followed, severe injury can result.

Never operate or service the printer with the protective cover removed from the laser/scanner assembly. The reflected beams, although invisible, can damage your eyes.

Some sheet metal edges, particularly around the formatter cage, are sharp. Be careful when working in these areas to avoid cutting yourself.

CAUTION

The printer contains parts that are sensitive to electrostatic-static discharge (ESD). Always perform servicing at an ESD-protected workstation. The ESD symbol appears in this chapter when the parts being serviced are especially susceptible to ESD damage.

CAUTION If possible, print the configuration page and menu map before working on the product. Replacing the formatter assembly clears the settings in memory. Clearing the settings can render the product inoperable. The list of configuration settings can assist in restoring the settings.

CAUTION To install a self-tapping screw, first turn it counterclockwise to align it with the existing thread pattern, then carefully turn clockwise to tighten. Do not overtighten. If a self-tapping screw-hole becomes stripped, repair the screw-hole or replace the affected assembly.

Before performing service . . .

- ☐ Print a configuration page, menu map, and an event log.
- ☐ Remove all accessories.
- ☐ Remove all media from the printer.
- ☐ Turn off the printer, and then unplug all cables from the printer, beginning with the power cable.
- ☐ Place the printer on an ESD mat.
- ☐ Remove all trays.
- ☐ Remove the toner cartridge.

After completing service . . .

- ☐ Replace the toner cartridge.
- ☐ Reinstall all trays.
- ☐ Reconnect all cables to the printer.
- ☐ Load media.
- ☐ Replace all accessories.
- ☐ Make sure the latest firmware is installed on the printer.
- ☐ Restore customer configuration settings.

Required tools

Tools

- Phillips #2 magnetized screwdriver with 6-inch shaft
- Flat-blade screwdriver with 6-inch shaft
- Needle-nose pliers
- ESD mat

Other helpful tools

- A container (such as an ice cube tray) to hold printer screws
- Masking tape and pen to tag and identify connectors and screws
- Penlight
- Gloves (when removing or replacing the transfer roller)

Screws used in the printer

All screws used in the printer are Phillips head, which require a Phillips screwdriver. The following figure shows the difference between a Phillips and a Posidriv screwdriver. Note that the Phillips tip has more beveled surfaces.

CAUTION Using a Posidriv screwdriver will damage the screw heads. Use a Phillips #2 screwdriver only.

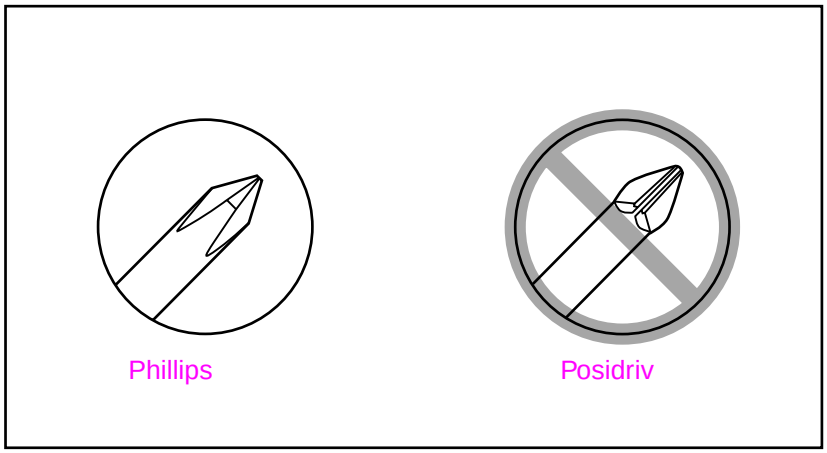

Figure 39. Comparing Phillips and Posidriv screwdrivers

Table 34 on page 137 describes the screws used in the printer and provides guidelines to help determine where each type of screw is used. The screws can vary in length depending on the thickness of the material being fastened.

Always note where each type of screw is located and replace each one into its original location.

CAUTION To install a self-tapping screw, first turn it counterclockwise to align it with the existing thread pattern, then carefully turn clockwise to tighten. Do not overtighten. If a self-tapping screw-hole becomes stripped, repair the screw-hole or replace the affected assembly.

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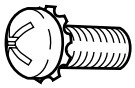
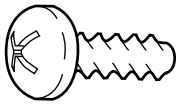
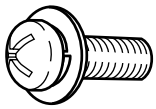
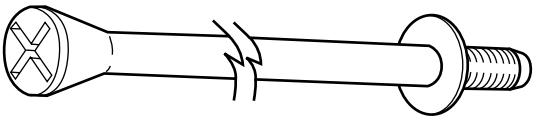
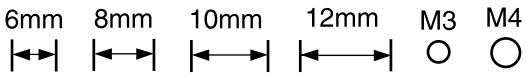
Table 34. Screws used in the printer

Drawing and description	Purpose
 Phillips machine screw with captive star washer	Used to fasten metal to metal when good electrical contact is needed
 Self-tapping Phillips screw	Used to fasten metal or plastic to plastic frames
 Phillips machine screw with lock and flat washer	Used to fasten metal or plastic to threaded plastic or metal
 Long screw (116 mm/4.8 inches)	Used to anchor the tray 2 feed module assembly to the engine

Screw measurement guide



Removing covers

CAUTION Before removing covers, turn off the printer and unplug the power cord and any cables.

Hint Left and right are indicated as you face the front of the printer unless otherwise noted.

Rear right side cover

Figure 40. **Removing the rear right side cover**

The formatter assembly and dual inline memory modules (DIMMs) are located underneath the right side cover.

1. Grasp the cover by its rear lip and pull it firmly toward the rear of the printer until it stops.
2. Remove the cover from the printer.

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Control panel

Control panel overlay

Figure 41. **Removing the control panel overlay**

1. Using a flat-blade screwdriver, gently pry upward and outward on the right side of the control panel overlay to loosen it.
2. Remove the control panel overlay from the tabs on the left and lift it upward, off of the printer.

Control panel board

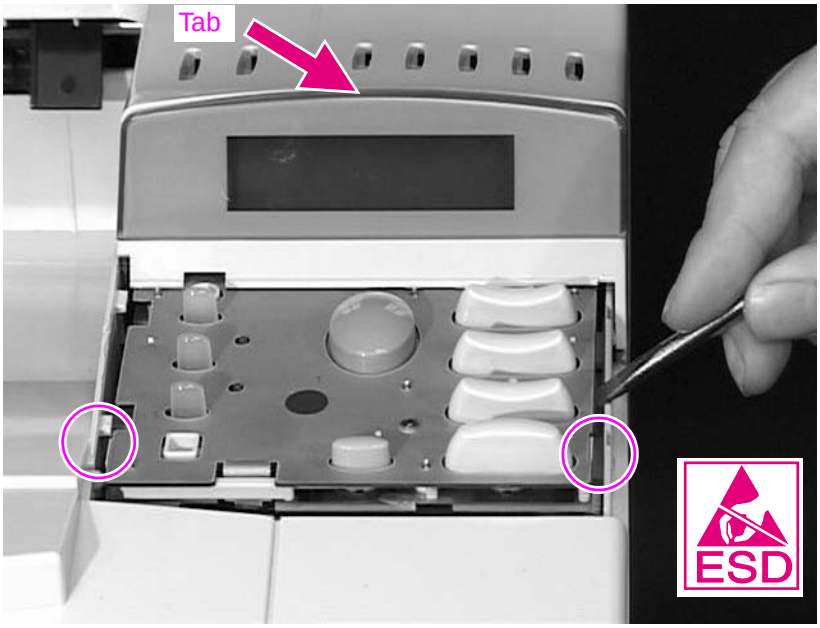

Figure 42. **Removing the control panel board**

1. Remove the control panel overlay (page 139).
2. Using a flat-blade screwdriver, release the claws on each side of the control panel board shown, and then lift upward.

CAUTION To prevent damage to the control panel board, release the claws before prying upward.

3. Remove the top of the control panel board from the top tab.
4. Disconnect the ribbon cable from the control panel board.

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Top cover

CAUTION Do not remove the toner cartridge when the top cover interlock is overridden. Cartridge memory will be damaged.

CAUTION To prevent damage to the toner cartridge, do not expose it to light for more than a few minutes.

1 To remove the top cover:

- **a** Open the top cover and remove the toner cartridge.
- **b** Remove the rear right side cover (page 138).
- **c** Remove the control panel (page 139).

Figure 43. Disconnecting the toner cartridge drive arm

2 Disconnect the toner cartridge drive arm by using needle-nose pliers to pinch the pin from its hinge on the top cover.

Hint Be sure to reconnect the toner cartridge drive arm when you replace the top cover, or the toner cartridge will not seat properly.

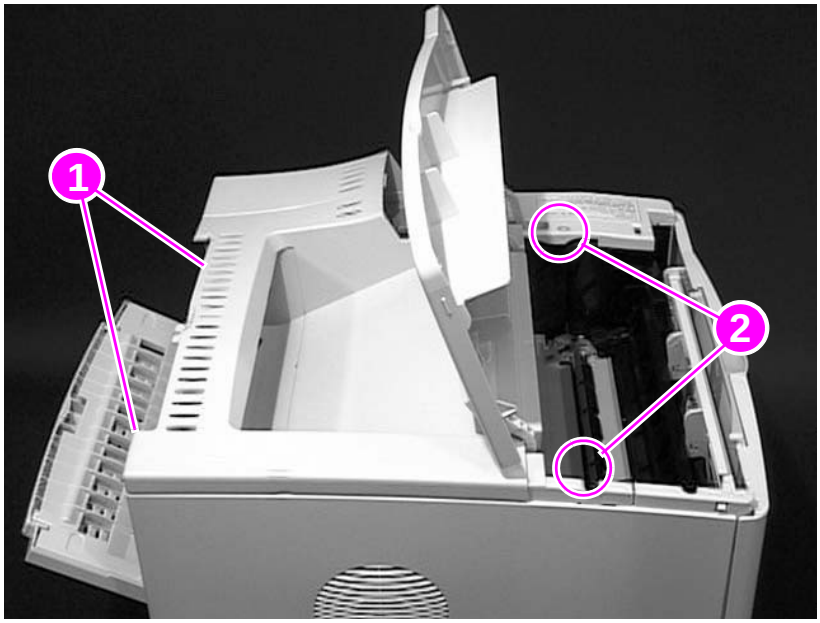

Figure 44. **Removing the top cover**

3 Open the rear output bin, and then remove two screws (callout 1) from the top cover, near the top of the bin.

4 Remove two more screws (callout 2) located under the top cover door.

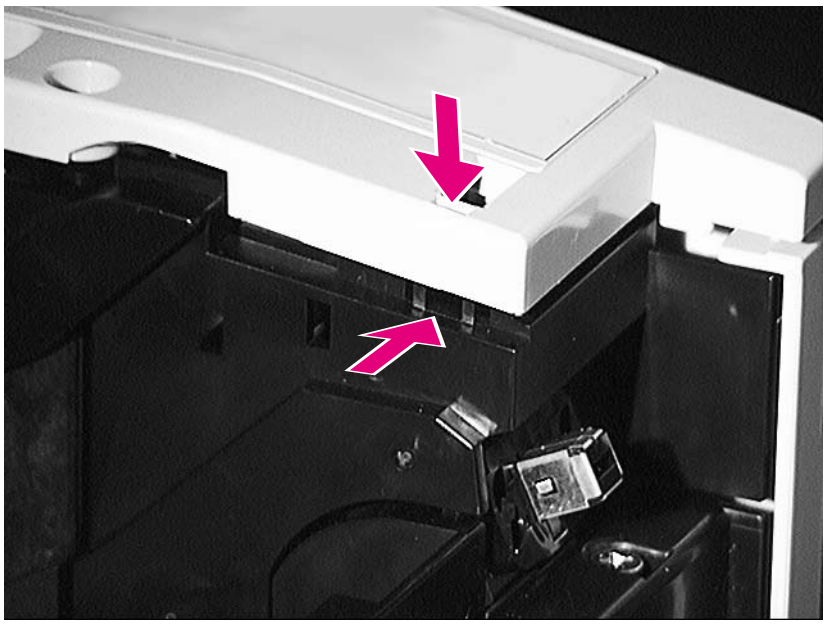

Figure 45. **Releasing tabs to lift the top cover**

5 Squeeze the frame below the tab to release the top cover. It might be necessary to use a small flat-blade screwdriver to release the tab inside the small hole.

6 Holding the output delivery assembly in place (located toward the rear of the printer), remove the top cover.

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Left side cover

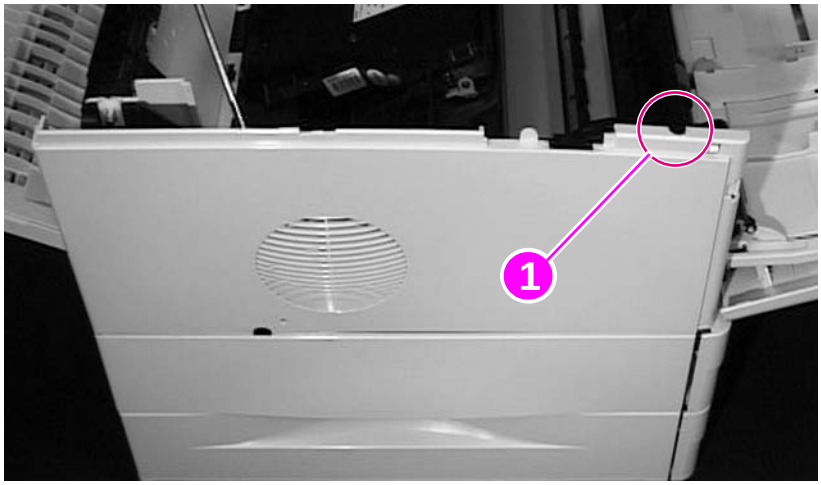

Figure 46. **Removing the left side cover**

1 To remove the left side cover:

- **a** Remove the rear right side cover (page 138).
- **b** Remove the control panel (page 139).
- **c** Remove the top cover (page 141).

2 Open tray 1.

3 Lift the left side cover upward off of the catch (callout 1), and then pull the cover away from the printer.

Front right side cover

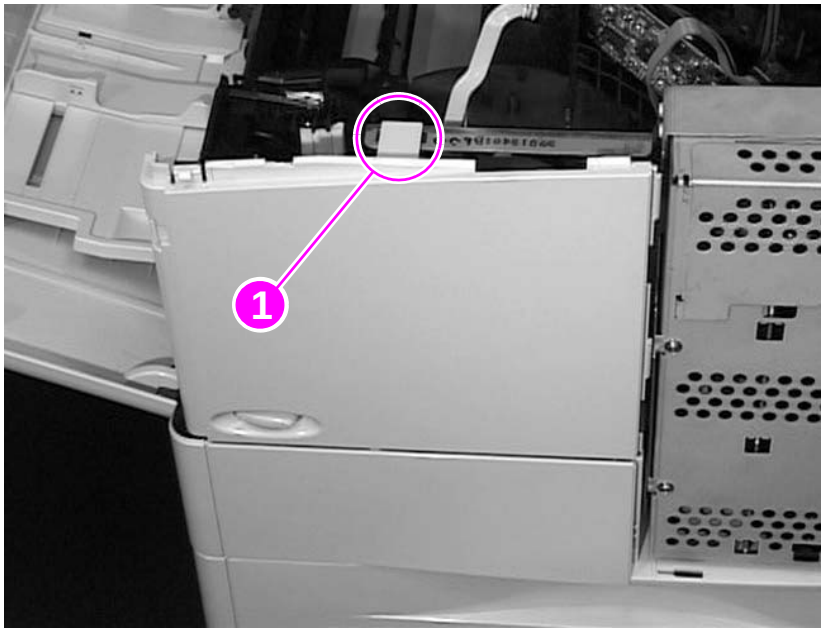

Figure 47. **Removing the front right side cover**

1. To remove the front right side cover:
   - **a** Remove the rear right side cover (page 138).
   - **b** Remove the control panel (page 139).
   - **c** Remove the top cover (page 141).
2. Open tray 1.
3. Release the latch (callout 1) at the top center of the cover.
4. Lift the cover straight up until it is free of the locating pins at the bottom and the power switch rod, then pull it away from the printer.

Hint When you reinstall the front right side cover, be sure to reconnect the power switch rod.

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Rear cover/rear output bin

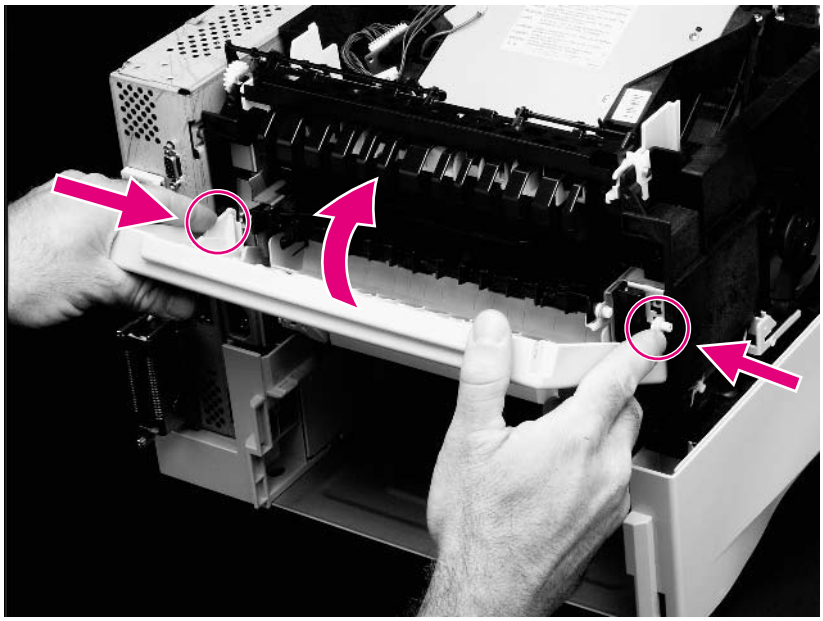

Figure 48. **Removing the rear cover/rear output bin**

1. Remove the tray 2 dust cover if installed.
2. Facing the rear of the printer, press the left side (formatter side) of the rear output bin and release the hinge from the slot.
3. Rotate the bin upward and slide it to the left to release the right hinge.

Hint Before reinstalling the dust cover, ensure the claws at the top of the dust cover are not damaged, and then snap the claws into place.

Tray 1

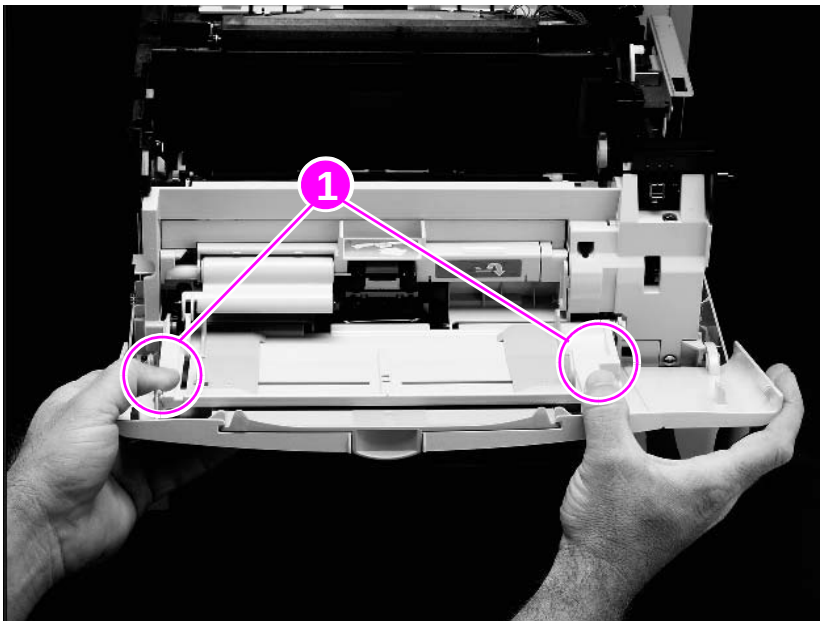

Figure 49. **Removing tray 1 from the front cover**

1 Open tray 1.

2 Push outward on the two slot hinges (callout 1) to release the pins on tray 1.

3 Slide the front cover to the right and remove it from the three hinges on the bottom.

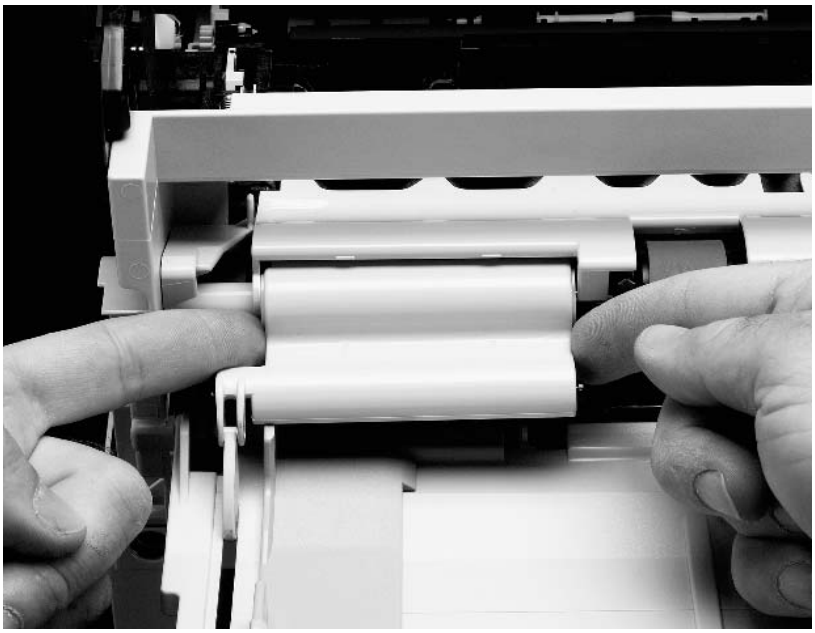

Figure 50. **Removing the tray 1 sensor arm cover**

4 Firmly pull both sides of the tray 1 sensor arm cover toward you until it releases from the shaft.

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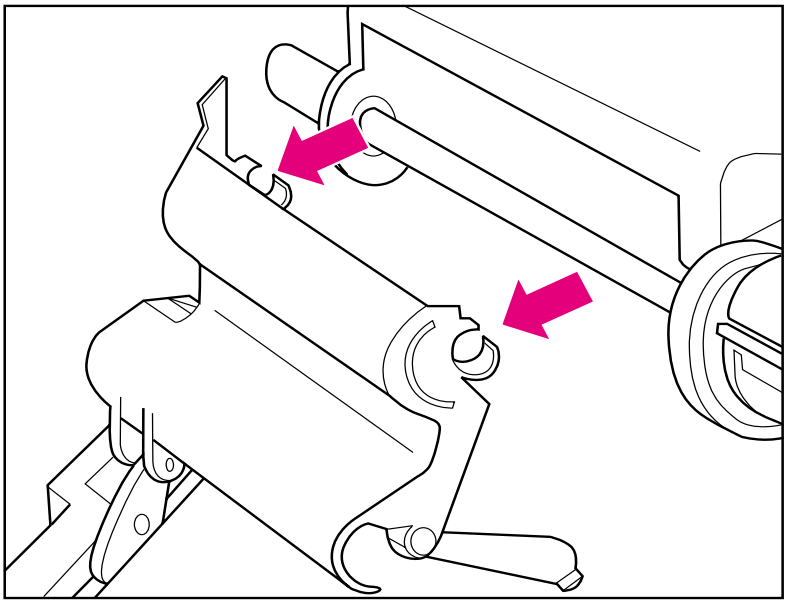

Figure 51. **Detail of the tray 1 sensor arm cover**

Hint When you reinstall the tray 1 sensor arm cover, be sure the sensor arms move freely.

5 Rotate tray 1 upward and release the hinge spring from the bottom of tray 1 located on the right tray 1 hinge pin. Note the position of the hinge spring before proceeding.

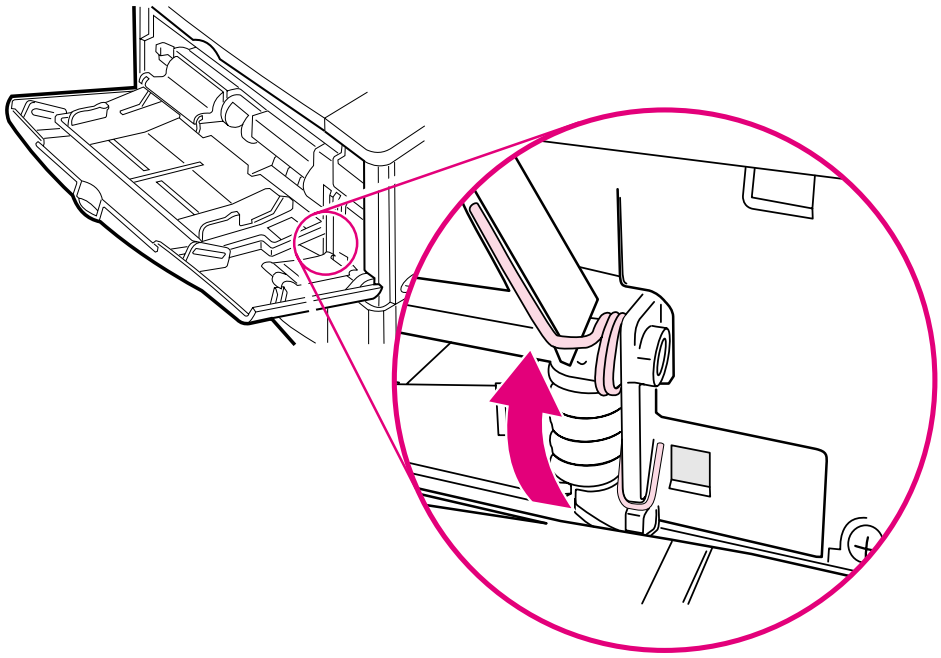

Figure 52. **Detail of hinge spring**

6 Rotate tray 1 downward completely and remove the tray from the left hinge.

7 Slide tray 1 to the left to remove the tray from the right hinge.

Hint Tape the hinge spring to tray 1.

Hint When you reinstall the hinge spring, place the long side of the spring in the slot underneath tray 1, and hook the short end of the spring in the small notch located directly below the pivot point.

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Fuser

WARNING! Let the fuser assembly cool before removal.

1. If a duplexer is installed, remove it. If a duplexer is not installed, remove the tray 2 dust cover from the rear of the printer by pulling from the bottom.
2. Remove the rear cover/rear output bin (page 145).

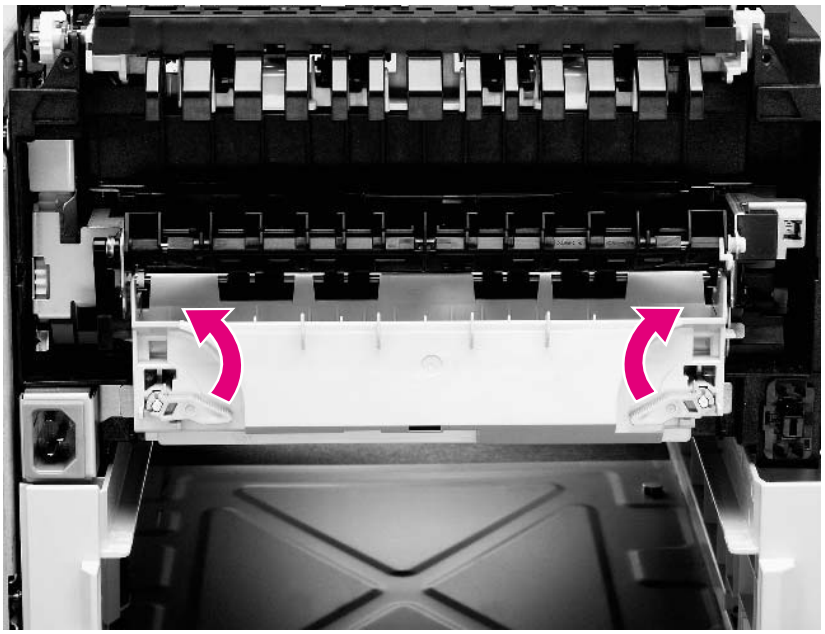

Figure 53. **Unlocking the fuser assembly**

3. Rotate the two blue levers on the fuser assembly up to the unlocked position.
4. Pull the fuser assembly straight out of the printer.

CAUTION To prevent damage to the fuser assembly, do not grasp the fuser by the black plastic diverter.

Hint When reinstalling the fuser assembly, be sure the blue levers are initially in the unlocked position. Make sure the fuser assembly is seated fully before rotating the blue levers down into the locked position.

Firmware DIMM

CAUTION Static electricity can damage dual inline memory modules (DIMMs). When handling DIMMs, either wear an antistatic wrist strap or frequently touch the surface of the DIMM's antistatic package, and then touch bare metal on the printer.

1. Print a configuration page, a menu map, and an event log. The information is necessary to reconfigure the printer after you replace the firmware DIMM.
2. Turn off the printer.
3. Unplug the power cord and disconnect any other cables.
4. Remove the rear right side cover (page 138). The formatter assembly is directly underneath.
5. Open the formatter access door by pulling on the large metal tab (see figure 55 on page 151).
6. Remove any installed accessories, EIO devices, memory DIMMs, or flash DIMMs.

Note Remove the old firmware DIMM installed in the lowest DIMM slot.

7. Remove the new firmware DIMM from the antistatic bag and install the DIMM in the lowest DIMM slot.

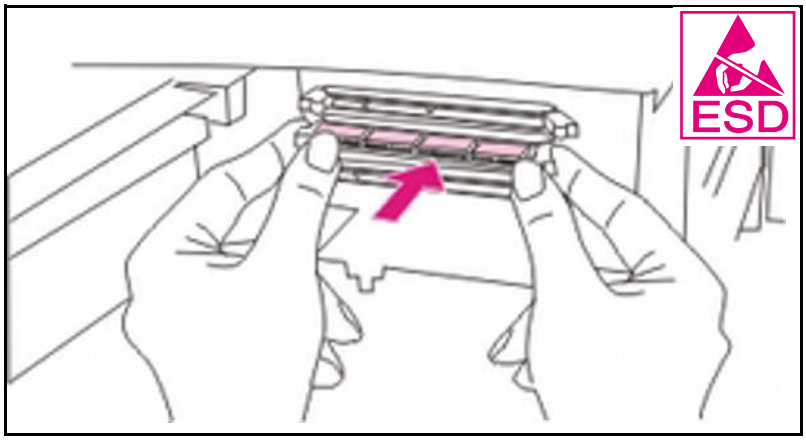

Figure 54. Installing a firmware DIMM

8. Close the formatter access door.
9. Plug the power cord into the printer.
10. Wait until READY appears.
11. Turn off the printer.
12. Reinstall all accessories, EIO devices, memory DIMMs, or flash DIMMs.
13. Turn on the printer.
14. Print a new configuration page and menu map, and compare the settings with the information pages printed in step 1. Verify the installed options and menu settings are consistent.

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Formatter assembly

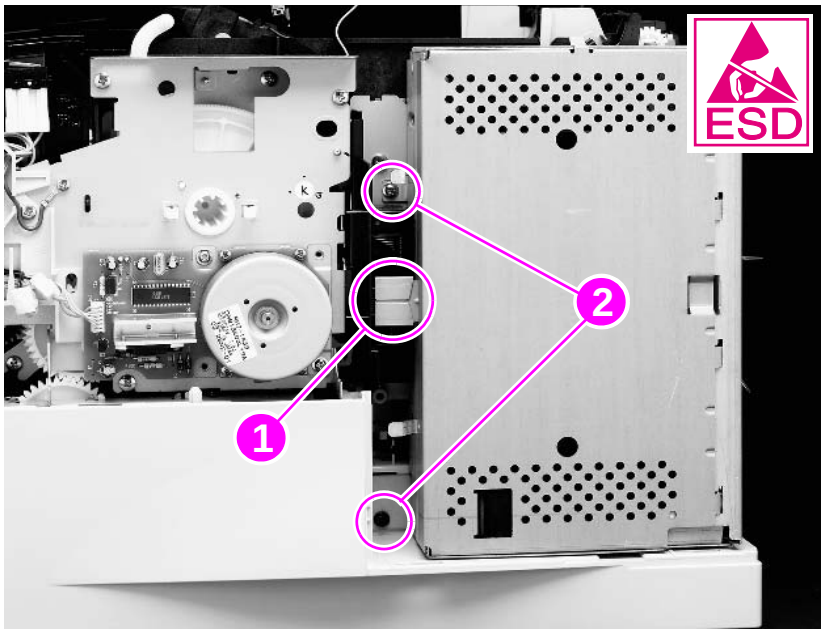

Figure 55. **Removing the formatter assembly**

1. Print a configuration page and menu map. The information is necessary to reconfigure the printer after you replace the formatter.
2. Remove the rear right side cover (page 138). The formatter assembly is directly underneath.
3. Pull outward on the large metal tab (callout 1) to open the DIMM access door. Remove and transfer any DIMMs or EIO accessories to the new formatter assembly.
4. Remove the two screws (callout 2) to the left of the formatter assembly.
5. Slide the formatter assembly toward the rear of the printer and remove it.

Hint If a new formatter assembly is installed, perform a NVRAM initilization (see page 79).

Note Using the configuration page and menu map you printed in step 1 above, reconfigure the printer after replacing the formatter assembly and initializing NVRAM. Be sure to reset the printer's page count, serial number, maintenance count, all configuration page features, and all control panel settings.

Hint When reinstalling the formatter assembly, ensure it is seated over the two stepped screws located behind the formatter assembly.

Output delivery assembly

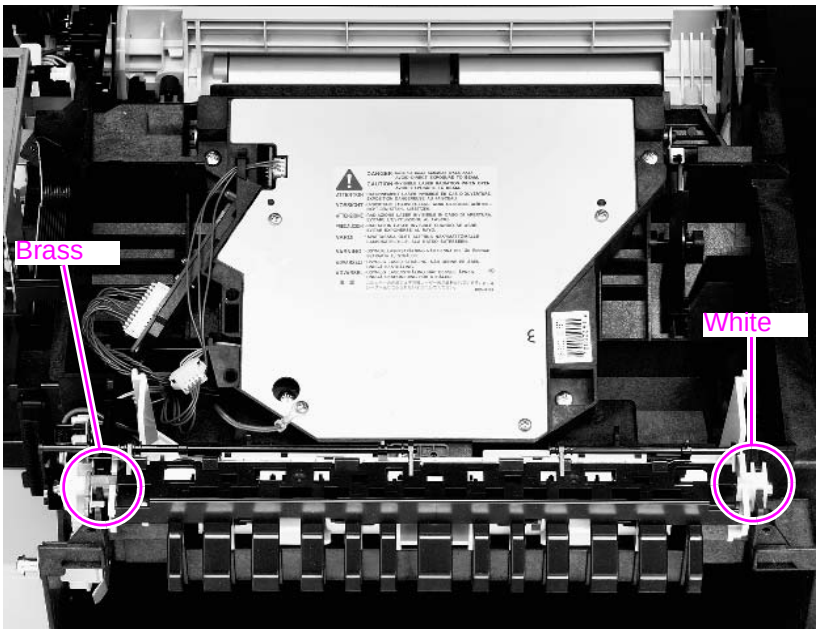

Figure 56. **Removing the output delivery assembly**

1 To remove the output delivery assembly:

- **a** Remove the rear right side cover (page 138).
- **b** Remove the control panel (page 139).
- **c** Remove the top cover (page 141).

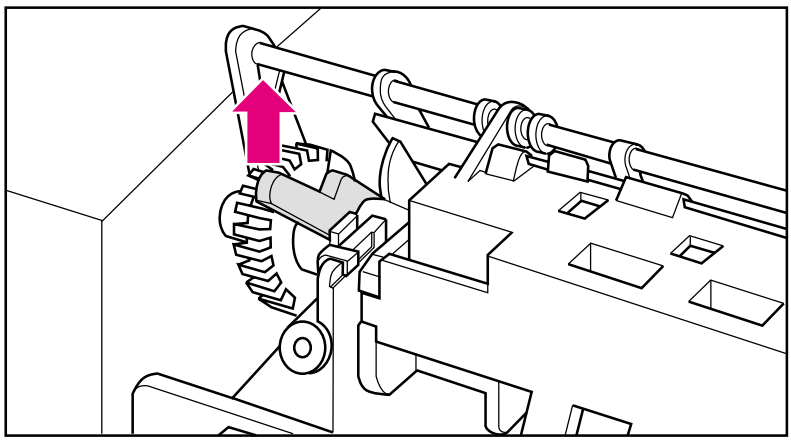

Figure 57. **Left end of output delivery assembly (brass arm)**

2 Facing the rear of the printer, rotate the brass arm up 90° located on the gear-end of the output delivery assembly.

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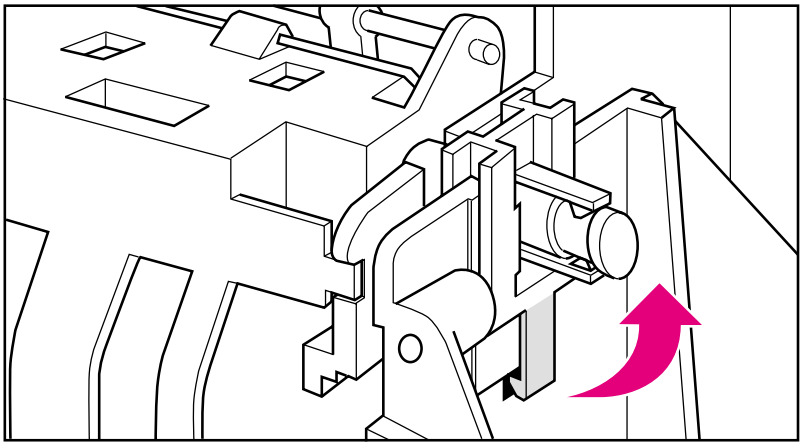

Figure 58. **Right end of output delivery assembly (white tab)**

3 Facing the rear of the printer, carefully release the white tab located on the right end of the output delivery assembly.

CAUTION The white tab is fragile. Use minimum deflection when releasing the tab.

4 Lift the assembly up and out of the printer.

CAUTION Lift the assembly carefully to avoid damaging the top output-bin-full sensor flag.

Hint When the assembly is replaced, the flag must be able to rotate freely.

Laser/scanner

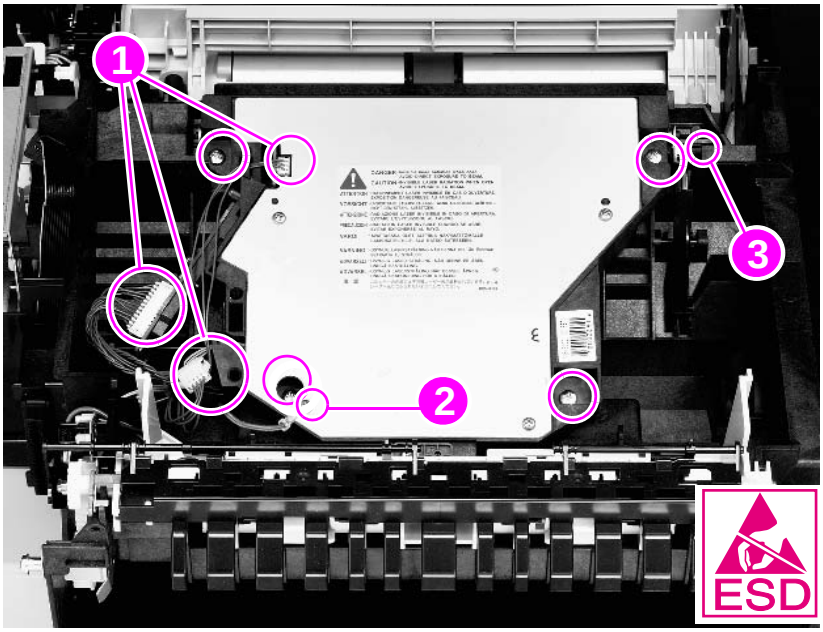

Figure 59. **Removing the laser/scanner**

1 To remove the laser/scanner:

- **a** Remove the rear right side cover (page 138).
- **b** Remove the control panel (page 139).
- **c** Remove the top cover (page 141).

The laser/scanner is on top of the printer, tilted toward the rear.

2 Unplug the three connectors (callout 1) as shown.

3 Remove the screw to disconnect the grounding cable (callout 2).

4 Remove the four recessed screws around the edges of the laser/scanner. Do not remove the three small screws on the cover of the laser/scanner.

CAUTION Do not loosen the Allen screw on the rear of the scanner assembly.

5 Lift the laser/scanner straight up.

Hint When you replace the laser/scanner, be sure the black shutter interlock arm (callout 3) is resting on top of the metal shutter plate.

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Cartridge memory

Cartridge memory controller

1 To remove the cartridge memory controller PCA:

   a Remove the rear right side cover (page 138).

   b Remove the control panel (page 139).

   c Remove the top cover (page 141).

   d Remove the laser/scanner assembly (page 154).

CAUTION Do not loosen the Allen screw on the rear of the laser/scanner assembly.

2 Disconnect the two wires from the cartridge memory controller PCA.

3 Remove the two self-tapping screws from the cartridge memory controller PCA.

Cartridge memory antenna

1 To remove the cartridge memory antenna:

   a Remove the toner cartridge.

   b Remove the rear right side cover (page 138).

   c Remove the control panel (page 139).

   d Remove the top cover (page 141).

   e Remove the laser/scanner assembly (page 154).

CAUTION Do not loosen the Allen screw on the rear of the laser/scanner assembly.

2 Disengage the antenna clips from the printer frame (located under the scanner near the memory controller PCA).

3 Disconnect the wire from the cartridge memory antenna.

4 Rotate the antenna (located inside the printer above the paper guide assembly) down to remove it from the metal bracket.

Fan

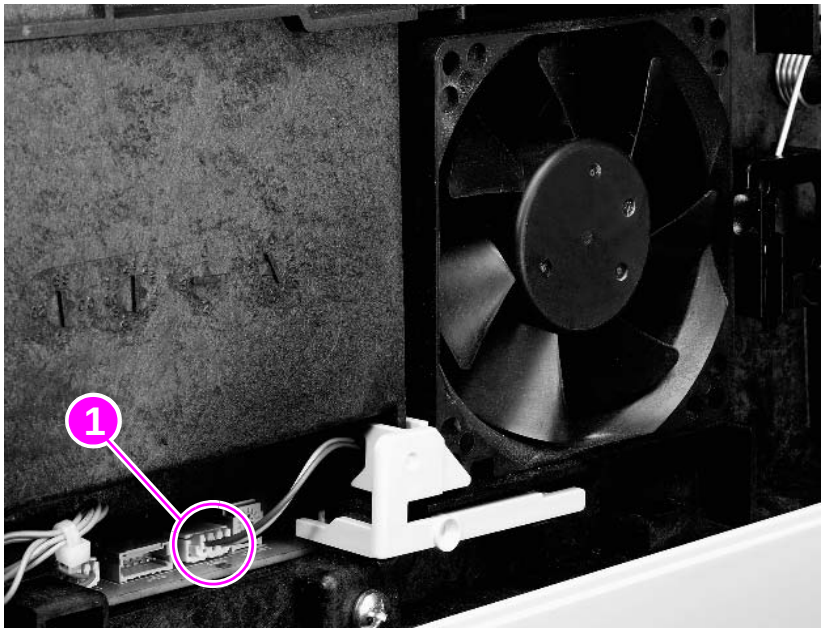

Figure 60. **Removing the fan**

1 To remove the fan:

- **a** Remove the rear right side cover (page 138).
- **b** Remove the control panel (page 139).
- **c** Remove the top cover (page 141).
- **d** Remove the left side cover (page 143).

2 Unplug the fan's connector (callout 1) to the engine controller board on the left side of the printer.

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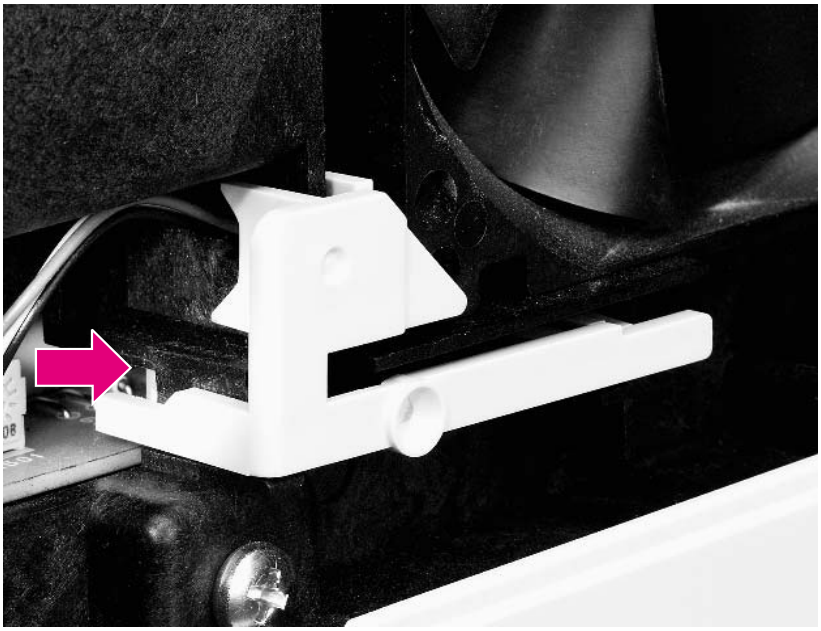

Figure 61. **Detail of the plastic fan clip**

3 Using a flat-blade screwdriver, press the retaining claw behind the left edge of plastic fan clip, and then remove the clip from the fan.

4 Slide the fan toward the rear of the printer and remove it.

Hint When replacing the fan, be sure the airflow arrow on the fan points inward.

Main motor

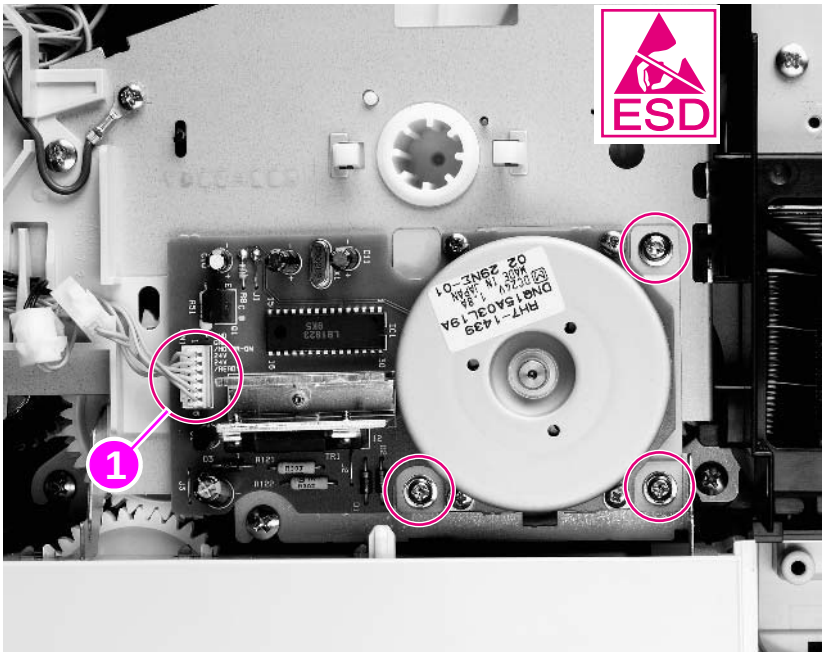

Figure 62. **Removing the main motor**

1 To remove the main motor:

- **a** Remove the rear right side cover (page 138).
- **b** Remove the control panel (page 139).
- **c** Remove the top cover (page 141).
- **d** Remove the front right side cover (page 144).

2 While holding the main motor board, unplug the main motor connector (callout 1) on the right front side of the printer.

3 Remove the three screws around the corners of the metal plate.

4 Remove the main motor from the printer.

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Transfer roller

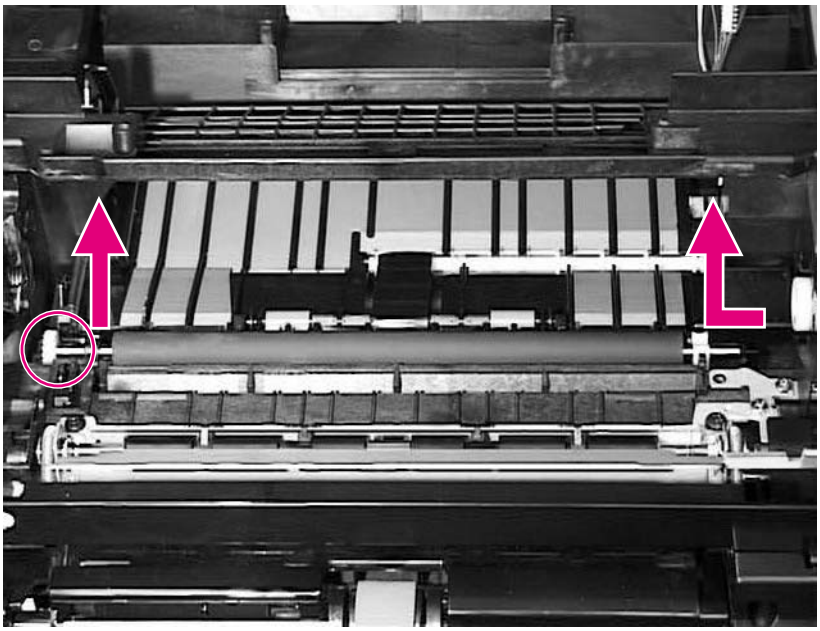

Figure 63. **Removing the transfer roller**

CAUTION Do not remove the toner cartridge when the top cover interlock is overridden. Cartridge memory will be damaged.

CAUTION To prevent damage to the toner cartridge, do not expose it to light for more than a few minutes.

1 Open the top cover and remove the toner cartridge. The transfer roller is underneath the toner cartridge.

CAUTION Do not touch the black rubber part of the roller. Skin oils on the roller can cause problems with print quality. Use of gloves is recommended.

2 Using a flat-blade screwdriver, lift the left end of the metal shaft out of place near the blue gear. Slide the transfer roller to the left to remove.

Hint When you install the transfer roller, make sure the black collar on the left side is oriented properly, with the open end down.

Tray 1 pickup roller

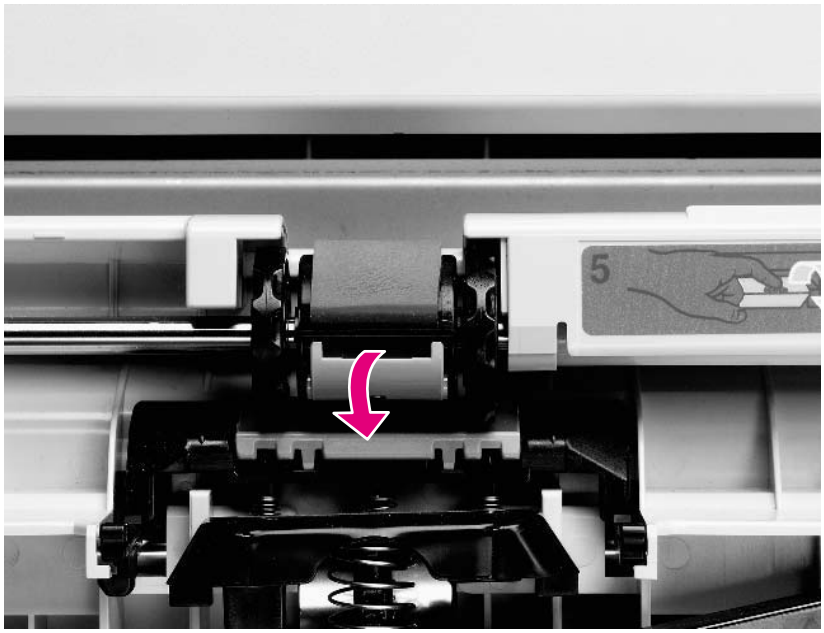

Figure 64. **Removing the pickup roller (shown with envelope entrance cover removed)**

1. Open tray 1. The tray 1 pickup roller is in the center of the tray 1 pickup assembly.
2. Grasp the envelope entrance cover directly above the pickup roller and pull it straight away from the printer.
3. Use a flat-blade screwdriver to pry open the blue latch on the roller.
4. Lift the roller out.

Hint

To replace the roller, make sure the pin in the roller lines up with the hole in the shaft. Then, ensure the blue latch snaps securely in place.

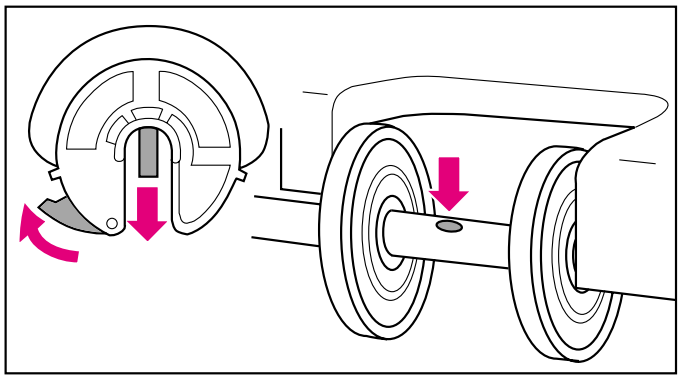

Figure 65. **Installation of tray 1 pickup roller**

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Tray 1 pickup assembly

1 To remove the tray 1 pickup assembly:

- **a** Remove the rear right side cover (page 138).
- **b** Remove the control panel (page 139).
- **c** Remove the top cover (page 141).
- **d** Remove the left side cover (page 143).
- **e** Remove the front right side cover (page 144).
- **f** Remove tray 1 (page 146).

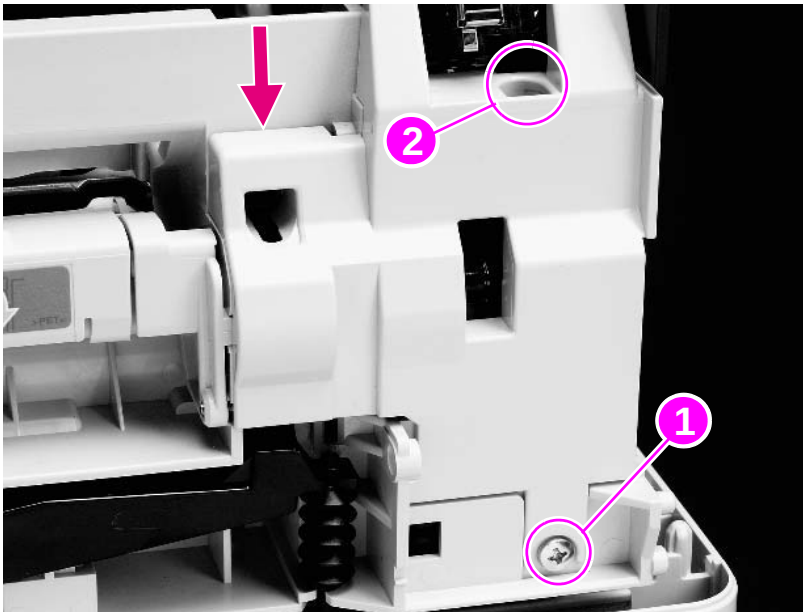

Figure 66. Removing the gear cover

2 Remove the gear cover as follows:

a. Remove the self-tapping screw (callout 1) at the bottom of the gear cover.

b. Remove the long screw (116 mm/4.8 inches) on the right side of the tray 1 pickup assembly (callout 2).

c. Remove the gear cover by pressing down on the claw.

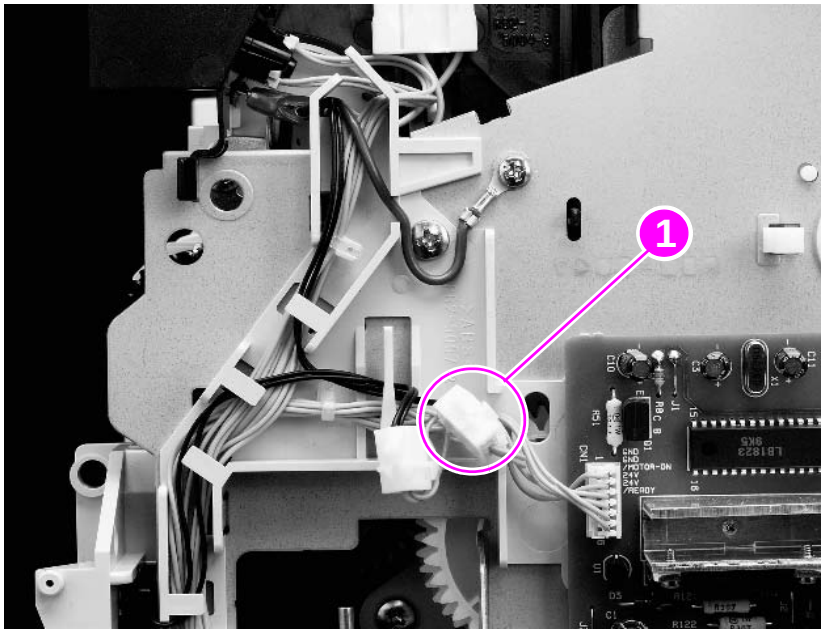

Figure 67. **Removing the tray 1 pickup assembly—right side**

3 Disconnect the three-pin solenoid connector (callout 1) on the right side of the tray 1 pickup assembly and unroute the cable from the cable guide. (Note the way the cables are routed for replacement.)

Note The solenoid connector is a three-part connector. Do not lose the gender-changer (center piece).

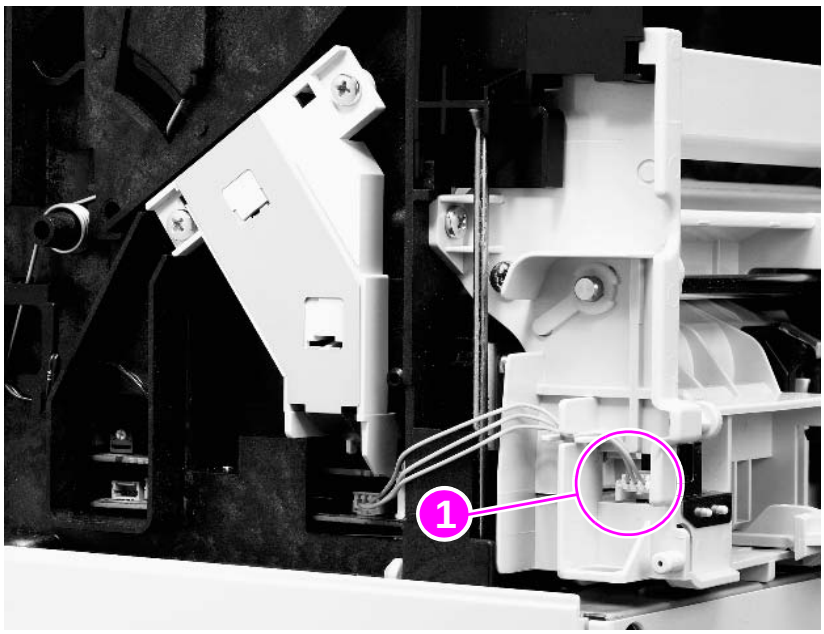

Figure 68. **Removing the tray 1 pickup assembly—left side**

4 Unplug the connector (callout 1) to the engine controller board on the left side of the tray 1 pickup assembly. (Note the way the cables are routed for replacement.)

5 Remove the long screw (116 mm/4.8 inches) from the left side of the assembly.

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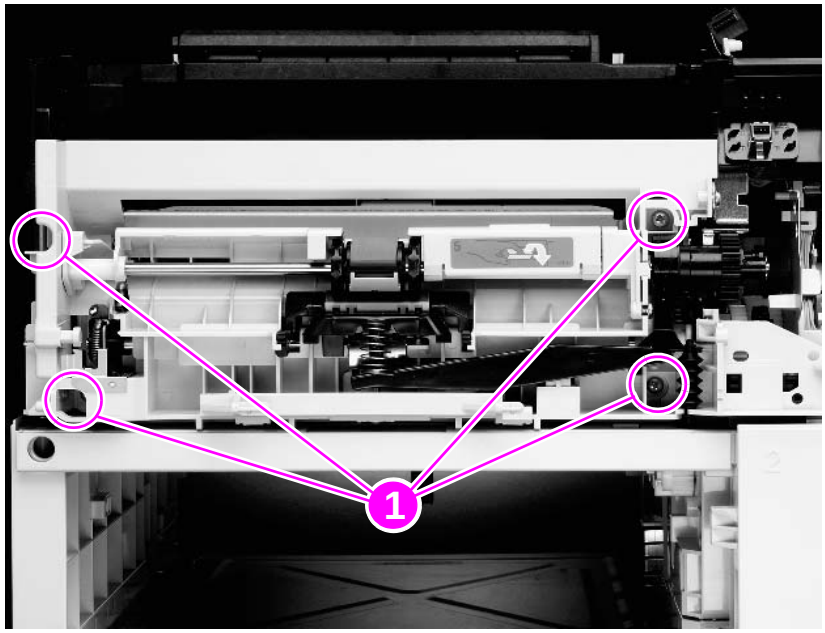

Figure 69. **Removing the tray 1 pickup assembly—front side**

6 Remove the four screws (callout 1) shown, and carefully pull the tray 1 pickup assembly straight out.

CAUTION Do not damage the solenoid cable on the right side of the tray 1 pickup assembly.

Note The left side toner cartridge might become dislodged while removing the tray 1 pickup assembly. Ensure the left side toner cartridge guide is installed before reinstalling the four screws that secure the tray 1 pickup assembly.

Right side toner cartridge guide

Remove the right side toner cartridge guide to get to the printer drive assembly. Follow the steps below:

1 To remove the tray 1 pickup assembly:

- **a** Remove the rear right side cover (page 138).
- **b** Remove the control panel (page 139).
- **c** Remove the top cover (page 141).
- **d** Remove the front right side cover (page 144).
- **e** Remove tray 1 (page 146).
- **f** Remove the tray 1 pickup assembly (page 161).

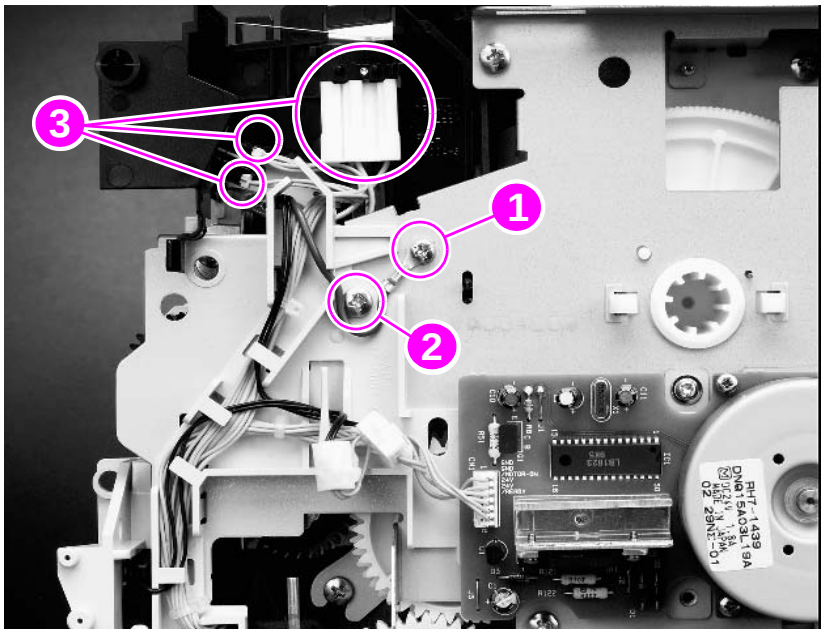

Figure 70. **Removing the right side toner cartridge guide**

2 Remove the small silver screw (callout 1) to disconnect the ground wire.

3 Remove the self-tapping screw (callout 2) on the right front side of the printer.

4 Lift the right side toner cartridge guide off the printer.

5 Unplug the three connectors (callout 3).

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Registration assembly

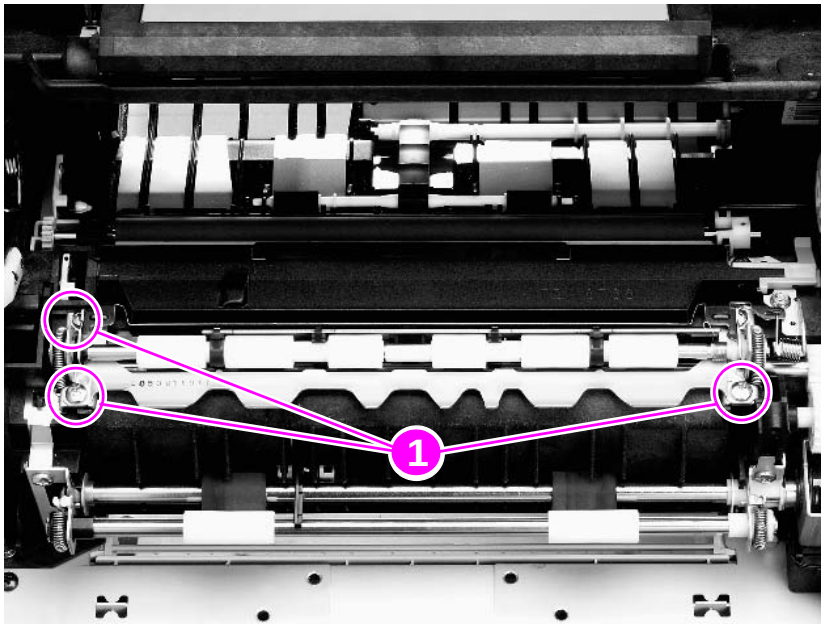

Figure 71. **Removing the registration assembly**

1 To remove the registration assembly:

- **a** Remove the rear right side cover (page 138).
- **b** Remove the control panel (page 139).
- **c** Remove the top cover (page 141).
- **d** Remove the left side cover (page 143).
- **e** Remove the front right side cover (page 144).
- **f** Remove tray 1 (page 146).
- **g** Remove the tray 1 pickup assembly (page 161).
- **h** Lift aside the right side toner cartridge guide (page 164). It is not necessary to unplug the connectors.

2 Remove the three self-tapping screws (callout 1) shown. (Lift the green handle on the right end of the registration assembly to get to the screw on the left rear side.)

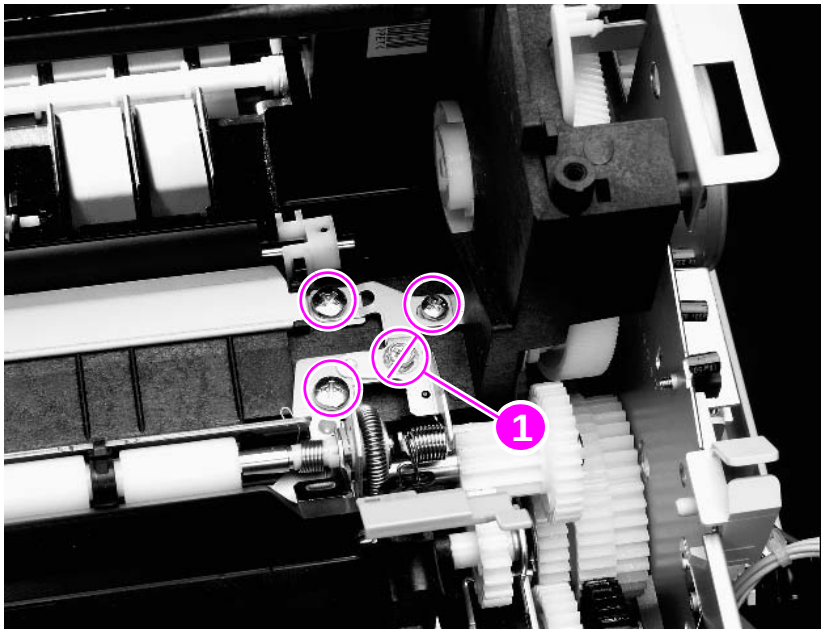

Figure 72. **Detail of screws for the registration assembly**

CAUTION Do not remove the silver, hex-headed screw (callout 1) closest to the registration assembly! It holds the spring in place. Take out the silver screw farther from the registration assembly (the one that is under the green handle).

3 Lift the green handle. Remove the two self-tapping screws and the rearmost silver screw shown. See the caution above.

4 Lift the registration assembly from the printer.

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Paper feed assembly

1 To remove the paper feed assembly:

- **a** Remove the rear right side cover (page 138).
- **b** Remove the control panel (page 139).
- **c** Remove the top cover (page 141).
- **d** Remove the left side cover (page 143).
- **e** Remove the front right side cover (page 144).
- **f** Remove tray 1 (page 146).
- **g** Remove the tray 1 pickup assembly (page 161).

The paper feed assembly is on the front of the printer.

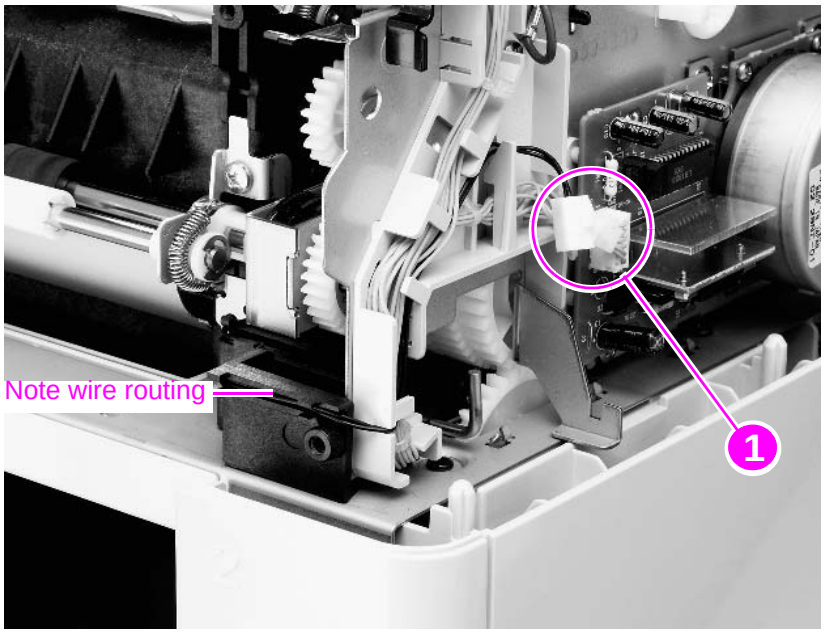

Figure 73. **Unplugging the connector to the paper feed assembly**

2 Unplug and unroute the two-pin connector (callout 1) from the right side.

CAUTION For replacement of the paper feed assembly, note the way the wires are routed to the connector. If a wire is routed improperly, it can be damaged.

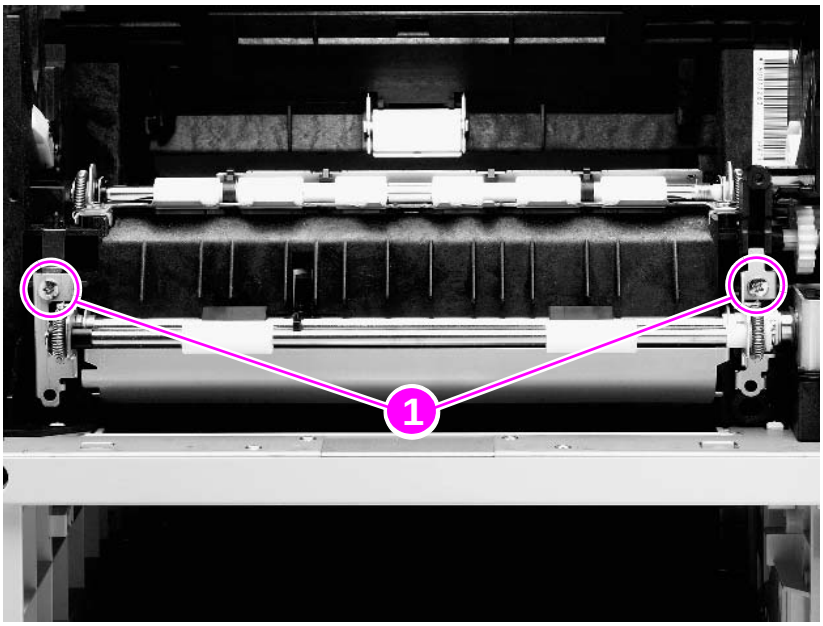

Figure 74. **Removing the upper screws from the paper feed assembly**

3 Remove the two upper screws (callout 1), and then remove the paper feed assembly.

Hint After replacing the paper feed assembly, make sure to insert the two upper screws only. The two lower screws are for holding the tray 1 pickup assembly in place. Ensure the lower sheet-metal guide hangs down loosely.

Hint For replacement of the paper feed assembly, orient the clutch properly by inserting the tab into the slot, as shown.

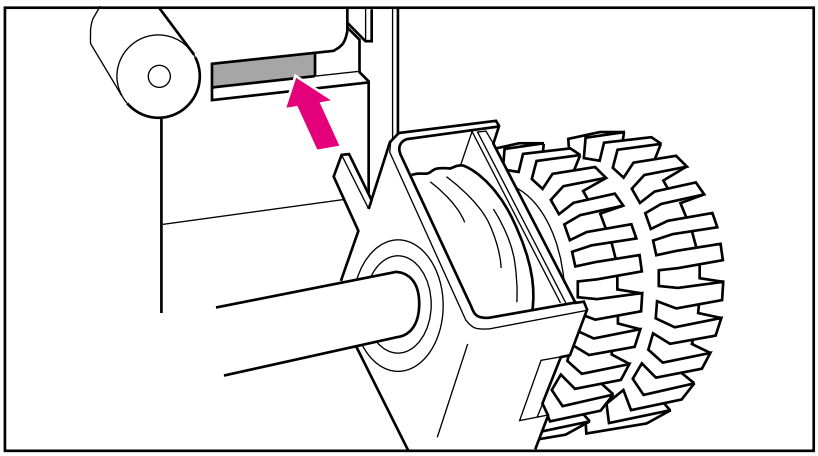

Figure 75. **Detail of clutch orientation**

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Printer drive assembly (gear train)

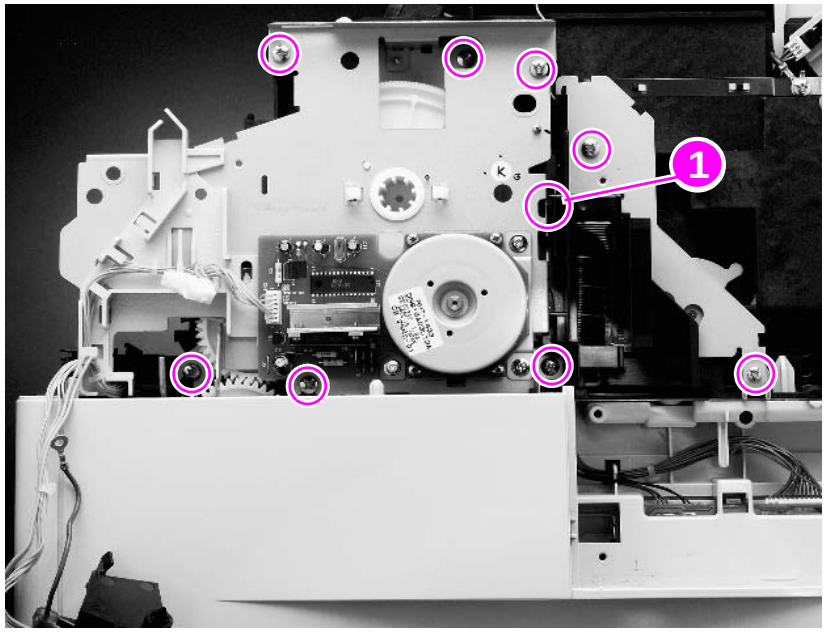

Figure 76. **Removing the printer drive assembly**

1 To remove the printer drive assembly:

- **a** Remove the rear right side cover (page 138).
- **b** Remove the control panel (page 139).
- **c** Remove the top cover (page 141).
- **d** Remove the left side cover (page 143).
- **e** Remove the front right side cover (page 144).
- **f** Remove the rear cover/rear output bin (page 145).
- **g** Remove the fuser assembly (page 149).
- **h** Remove tray 1 (page 146).
- **i** Remove the tray 1 pickup assembly (page 161).
- **j** Remove the right side toner cartridge guide (page 164).
- **k** Remove the registration assembly (page 165).
- **l** Remove the formatter assembly (page 151).

2 Remove the seven self-tapping screws and one machine screw.

3 Pull the ribbon cable assembly upward to release it from the two tabs at the bottom. Then, pull outward to release it from the retaining claw and pin (callout 1).

4 Unplug the main motor, and remove all remaining wires from the white plastic cable guide.

Note It might be necessary to separate the engine module from the paper-feed module (see page 171).

5 Slide out the printer drive assembly.

Note When you reinstall the printer drive assembly, slide the top in first and then push the bottom in.

Delivery drive assembly

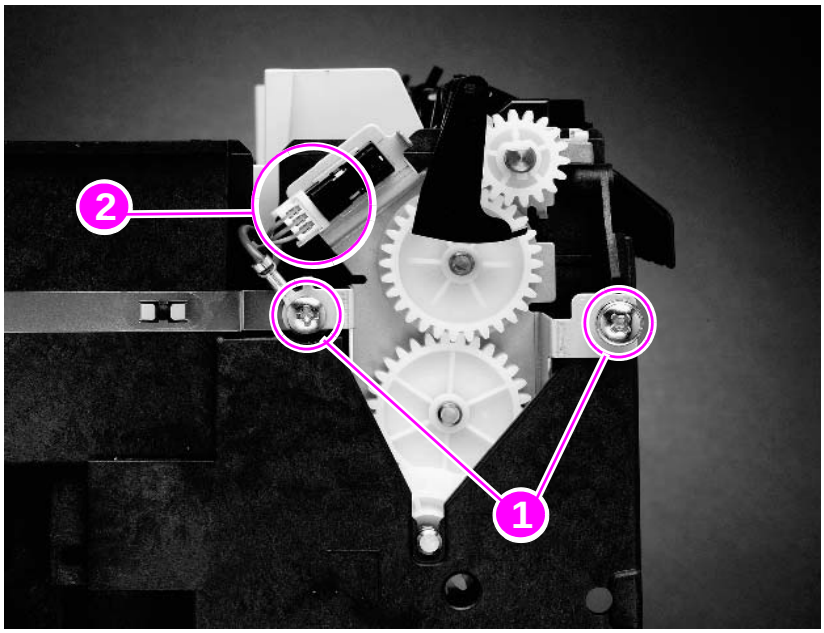

Figure 77. **Removing the delivery drive assembly**

1 To remove the delivery drive assembly:

- **a** Remove the rear right side cover (page 138).
- **b** Remove the control panel (page 139).
- **c** Remove the top cover (page 141).
- **d** Remove the rear cover/rear output bin (page 145).
- **e** Remove the fuser assembly (page 149).
- **f** Remove the output delivery assembly (page 152)
- **g** Remove the formatter assembly (page 151).

2 Remove the two screws (callout 1).

3 Unplug the three-pin connector (callout 2) shown.

4 Lift the delivery drive assembly upward, away from the printer.

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Separating the engine module from the paper-feed module

1 To separate the engine module from the paper-feed module:

- **a** Remove the tray 2 dust cover or the duplexer (if installed).
- **a** Remove the rear right side cover (page 138).
- **b** Remove the formatter assembly (page 151).
- **c** Remove the two long screws from the tray 1 pickup assembly (page 161 and 162).

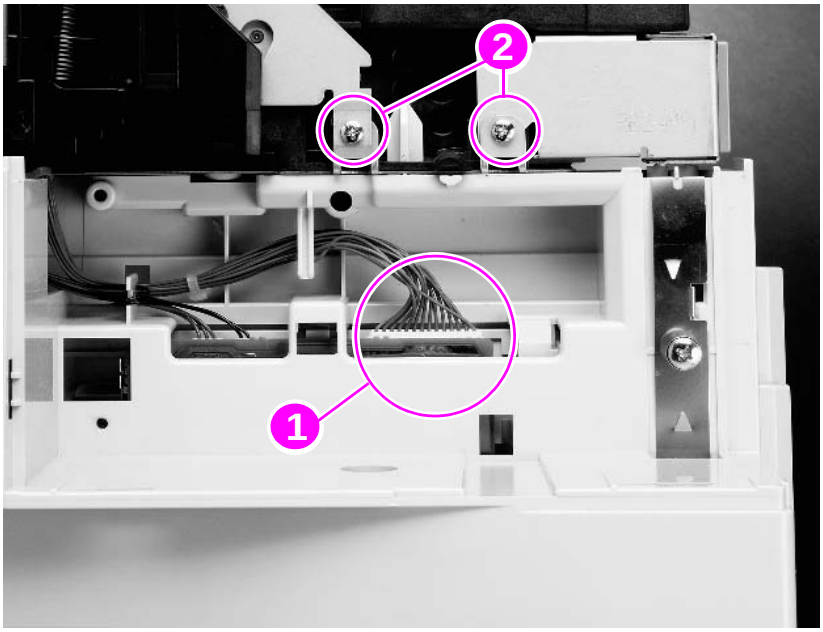

Figure 78. **Unplugging the connector to the paper-feed module**

2 Unplug the connector (callout 1) to the paper-feed module on the right rear side of the printer (under the formatter assembly). Remove the cable from its brackets.

3 Remove the two screws (callout 2), or one screw, if the printer drive assembly has been removed.

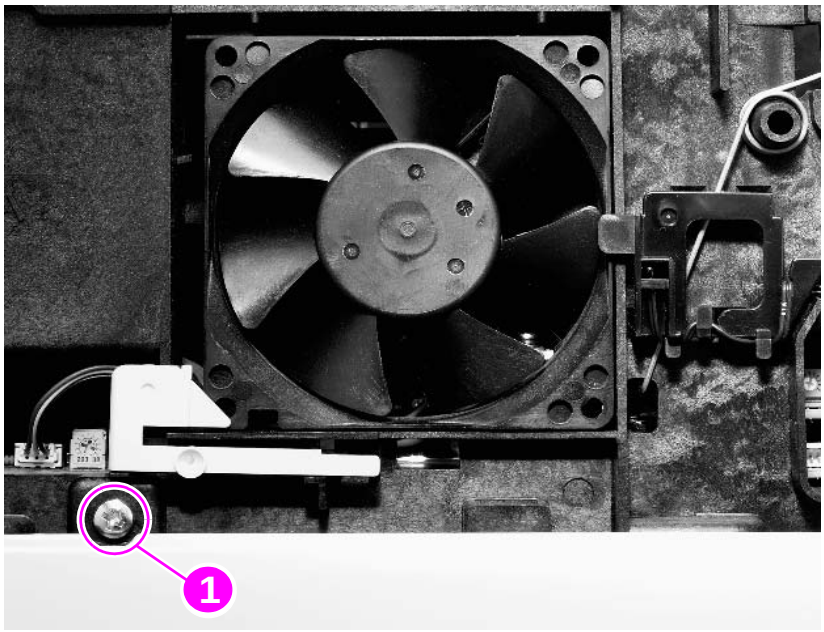

Figure 79. **Separating the engine from the paper-feed module**

4 Remove the single, self-tapping screw (callout 1) from the left side of the printer, below the fan.

CAUTION Lift the engine carefully, being sure that all cables are disconnected.

5 Lift the engine away from the paper-feed module.

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Engine controller board

Note After you replace the engine controller board, readjust the top margin as described on page 175.

1. Remove the fuser assembly (page 149).
2. Separate the engine from the paper-feed module (page 171). The engine controller board is on the underside of the engine.

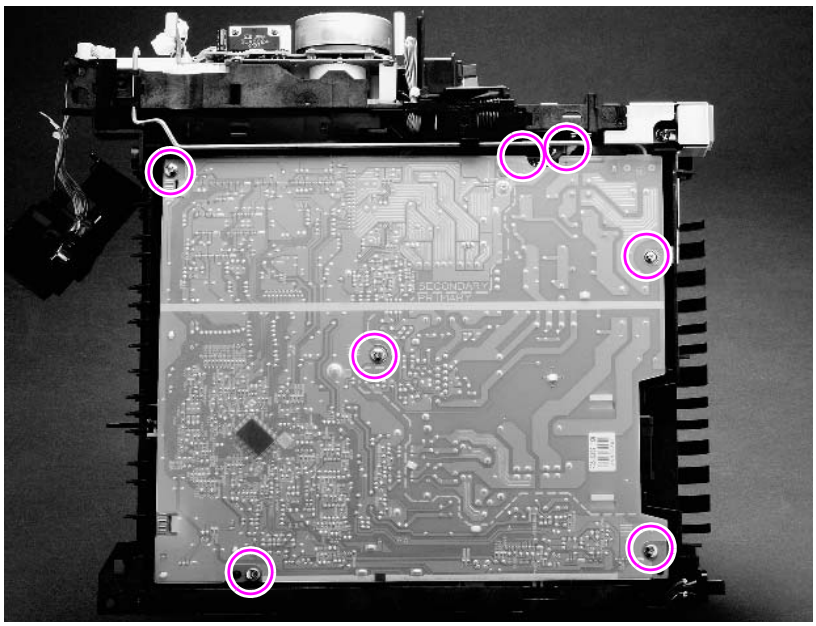

Figure 80. **Removing the engine controller board**

3. Remove the seven screws shown.
   - Four self-tapping M4 screws (three in front and one in the right rear)
   - From the left rear, three M3 screws (two recessed)
4. Disconnect the power switch rod.

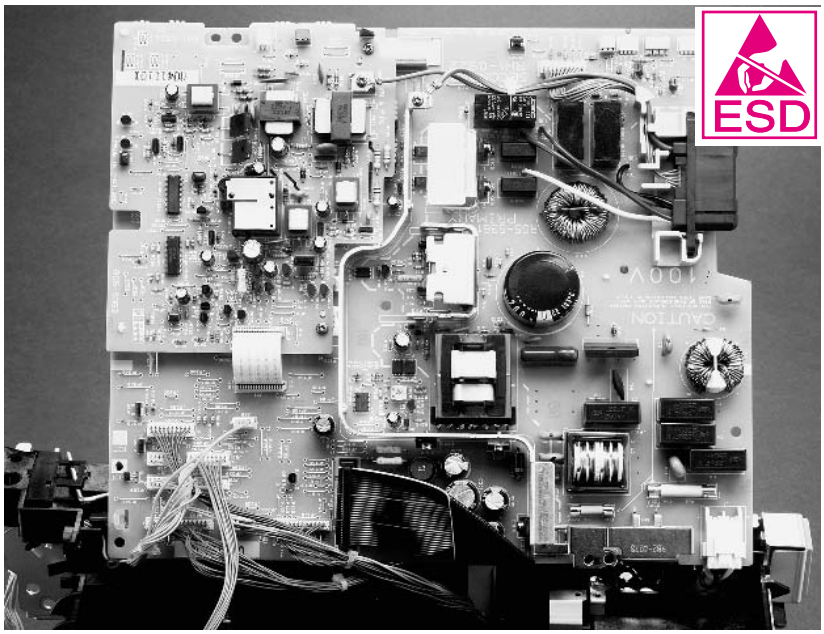

Figure 81. **Removing the engine controller board**

5 Disconnect the three connectors on the fan side.

6 Lifting from the fan side, tip the board up.

Hint Use masking tape and a pen to identify all cables, if necessary.

7 Unplug all connectors from the engine controller board.

Hint The black cable holder in the middle of the engine controller board can be folded aside with the cables intact. When you replace the board, reconnect and route all cables before reconnecting the power switch rod.

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Adjusting the top margin

When you replace the engine controller board, you must readjust the top margin as follows:

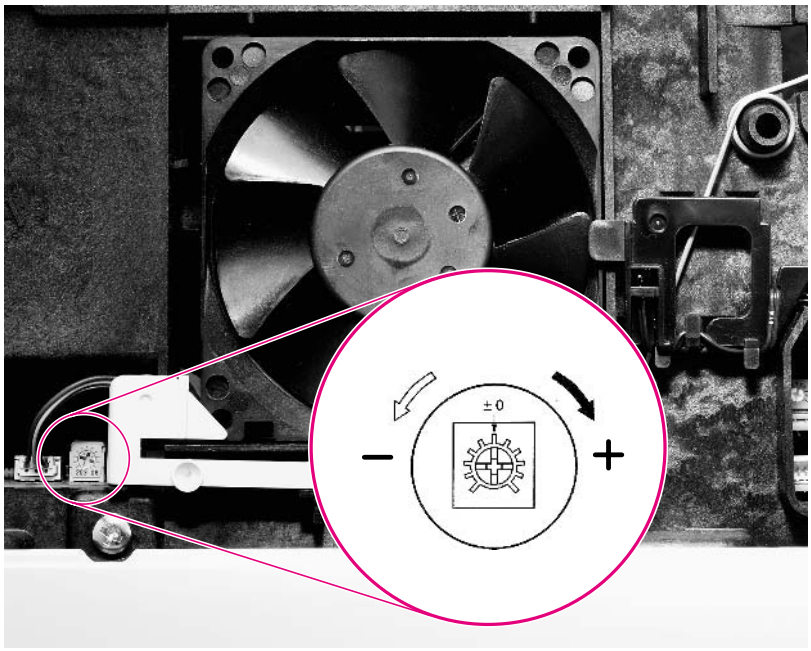

Figure 82. **Location of VR501**

1. After setting the VR501 on the engine controller board to the center position (0), load letter or A4 paper in tray 2, 3, or 4. Press the engine test print button (located on the left side of the printer, below the vent) to make several test prints.

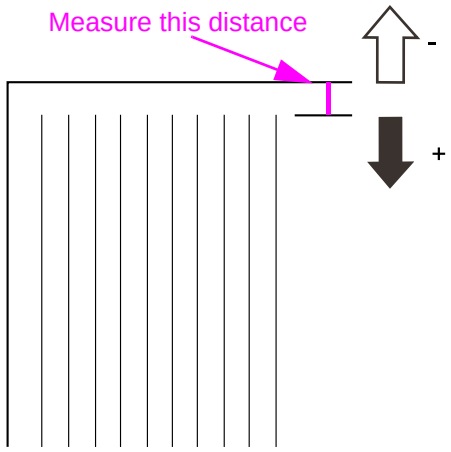

Figure 83. **Adjusting the top margin**

2. Measure the distance between the leading edge of the paper and the print pattern. Measure all the test prints and calculate the average.
3. Adjust VR501 so that the margin becomes 2 mm (.08 inch). Turn VR501 clockwise to increase the margin or counter-clockwise to decrease the margin.
4. Make several test prints again and perform step 2 above. If the top margin is still incorrect, repeat the procedure.

Paper-feed guide assembly

1 To remove the paper-feed guide assembly:

- **a** Remove the rear right side cover (page 138).
- **b** Remove the control panel (page 139).
- **c** Remove the top cover (page 141).
- **d** Remove the left side cover (page 143).
- **e** Remove the front right side cover (page 144).
- **f** Remove the rear cover/rear output bin (page 145).
- **g** Remove the fuser assembly (page 149).
- **h** Remove tray 1 (page 146).
- **i** Remove the tray 1 pickup assembly (page 161).
- **j** Remove the right side toner cartridge guide (page 164).
- **k** Remove the registration assembly (page 165).
- **l** Remove the formatter assembly (page 151).
- **m** Remove the printer drive assembly (page 169).
- **n** Separate the engine module from the paper-feed module (page 171).
- **o** Remove the engine controller board (page 173).

2 Remove the plastic main gear cable guide by releasing the three tabs.

3 Loosen the plastic formatter ribbon cable guide.

4 Disconnect the paper-sensor cable.

5 Remove the two self-tapping screws.

6 Carefully remove the paper-feed guide assembly.

Note The engine controller board grounding spring might interfere with removal.

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Paper-feed rollers for trays 2, 3, and 4

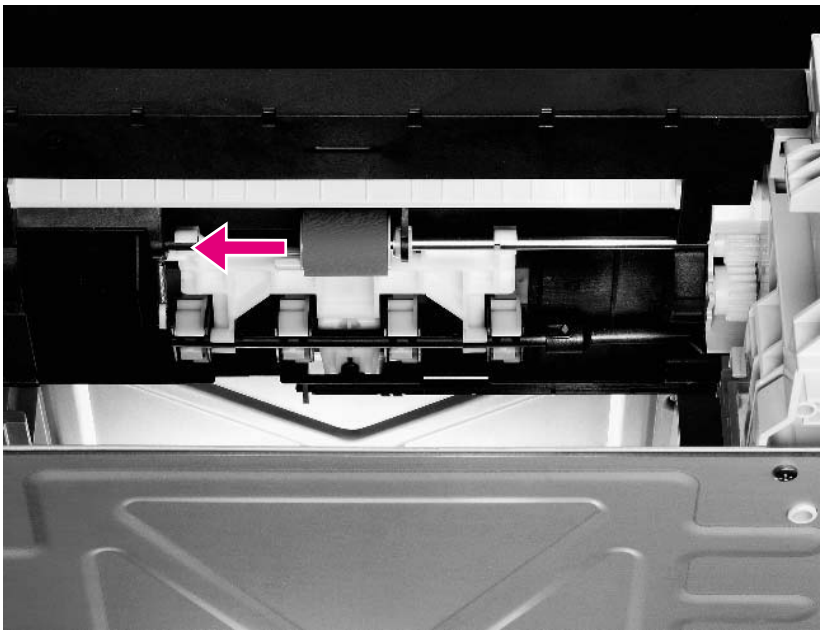

Figure 84. **Removing the paper feed roller**

1. Remove the paper tray(s) from the paper feeder(s). The paper-feed roller is inside the feeder, on top of the paper feeder assembly.
2. Pinch the release at the left side of the roller and slide it off the shaft.

Hint When reinstalling the feed roller, ensure it locks into place. Otherwise, repeated paper jams might occur.

Separation rollers for trays 2, 3, and 4

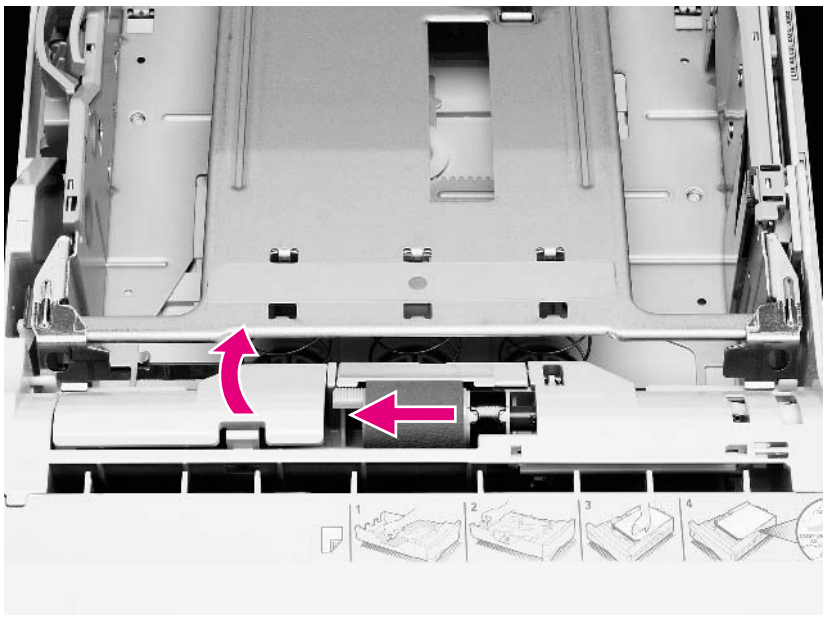

Figure 85. **Removing the separation roller**

The separation roller is inside the paper trays.

1 Release the latch and lift the access cover inside the tray.

2 Pinch the release at the left side of the roller and slide it off the shaft.

CAUTION To prevent damage to the printer, ensure the access cover is securely locked into position.

Note When reinstalling the separation roller, ensure it locks into place. Otherwise, repeated paper jams might occur.

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Tray 2 paper-feed module disassembly

Remove the paper-feeder plate to gain access to the paper pickup drive assembly. It is not necessary to separate the engine module from the paper-feed module to gain access to the paper-size detection PCB, although it will provide easier access.

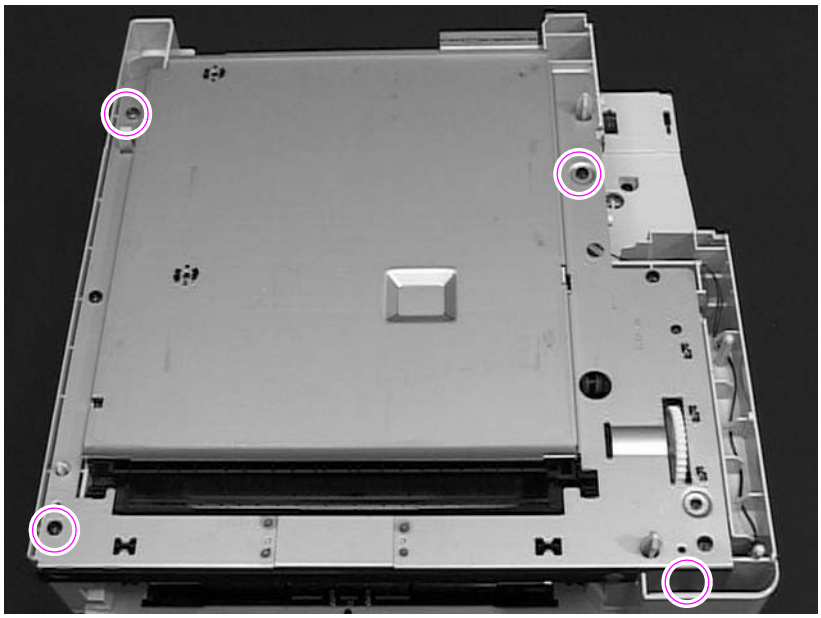

Figure 86. **Removing the tray 2 paper-feeder plate**

1. Separate the engine module from the paper-feed module (page 171).
2. Remove the tray from the paper-feed module.
3. Remove the four self-tapping screws (one screw is recessed in front).
4. Lift the paper-feeder plate to remove it.
5. Release the two tabs on the paper-size detection PCB cover.
6. Disconnect the three cables on the paper-size detection PCB.
7. Press the two tabs to release the paper-size detection PCB. Note the cable routing.
8. Slide the PCB from the paper-feeder frame.
9. Remove the two machine screws from the paper pickup drive assembly.

Tray 3 and 4 paper-feed module disassembly

Remove the paper-feeder plate to gain access to the paper pickup drive assembly. It is not necessary to remove the paper-feeder plate to access the feeder controller PCA, although it will provide easier access.

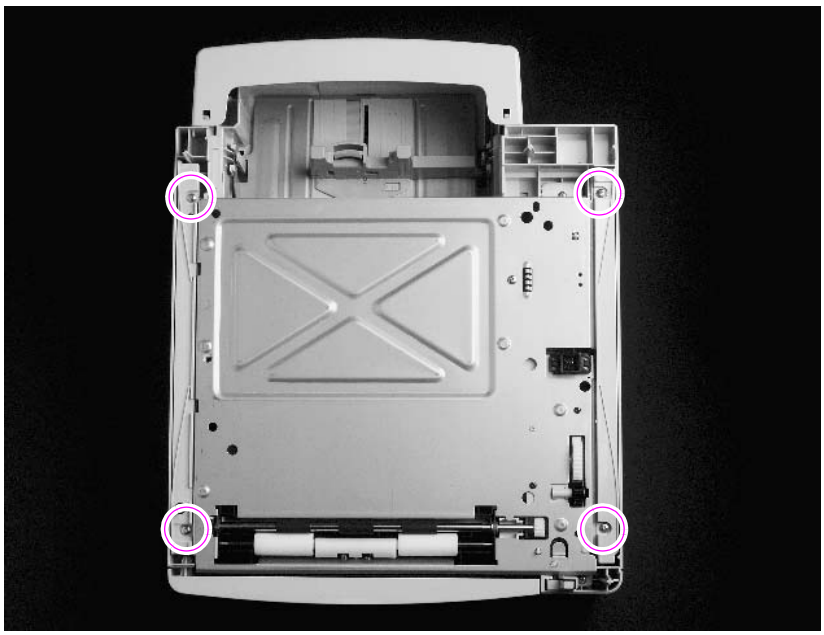

Figure 87. **Removing the paper-feeder plate**

1. Lift the printer from the optional feeder.
2. Remove the tray from the paper feeder.
3. Remove the four self-tapping screws from the side rails as shown, and then lift the side rails from the paper feeder.
4. Remove the six self-tapping screws around the paper-feeder plate (two on the left and four on the right).
5. Remove the two machine screws and one self-tapping screw from the paper-feeder plate and the paper pickup assembly.
6. Carefully lift the paper-feeder plate from the paper-feeder frame and the paper pickup assembly.
7. Use a flat-blade screwdriver to release the two tabs on the feeder controller PCA cover.
8. Disconnect the four connectors from the PCA. Note the cable routing.
9. Remove the single self-tapping screw from the PCA.
10. Slide the PCA from the paper-feeder frame.

Note The clutch release lever (located near the tray number) might dislodge if not careful. figure 89 and figure 90 show detail of the lever location for reassembly.

11. Remove the paper pickup assembly.
12. Ensure the clutch release (figure 88) functions properly after the paper-feeder plate is reinstalled.

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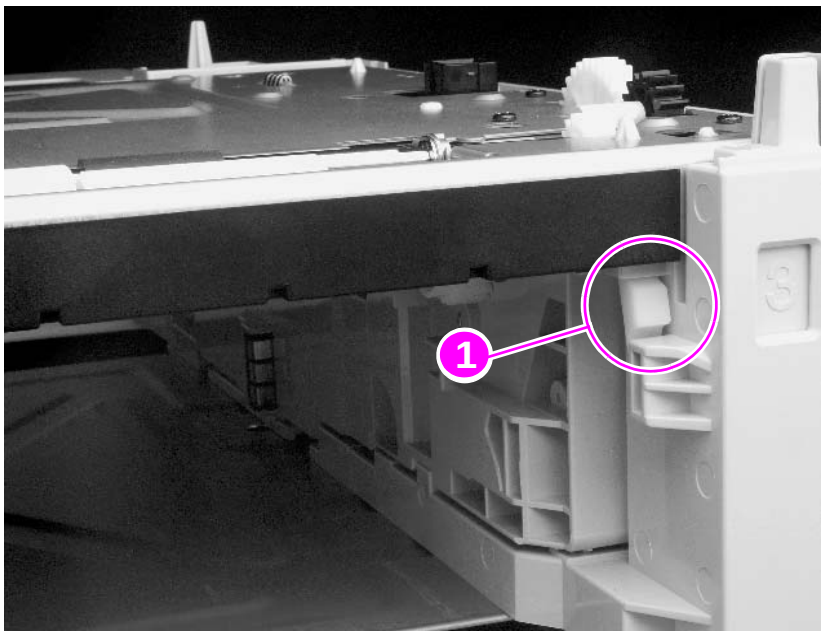

Figure 88. **Detail of clutch release**

Hint

Pull the clutch release (callout 1) towards the front of the tray. Hold the clutch in place as you reinstall the paper-feeder plate.

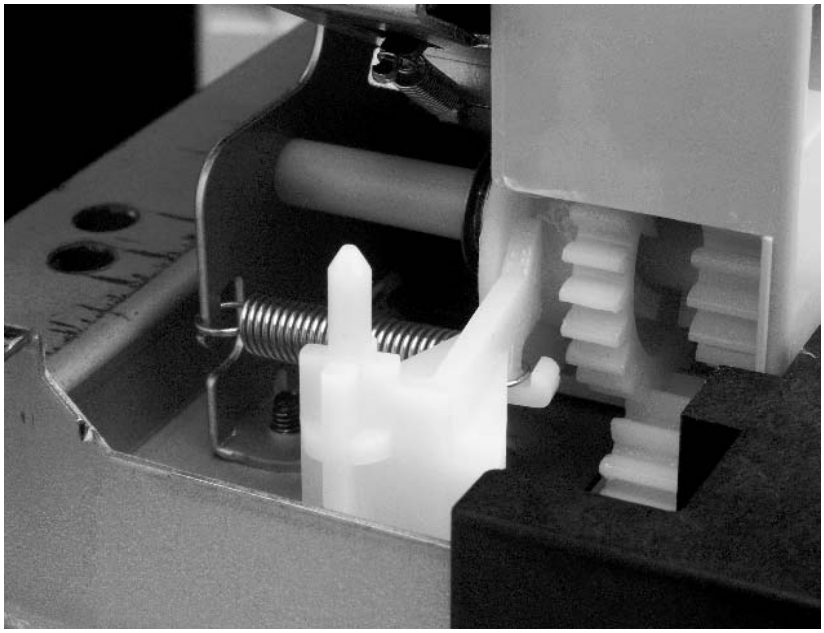

Figure 89. **Detail of spring and lever**

Note

If the spring and lever dislodge when removing the paper-feeder plate, use needle-nose pliers to reattach the spring before replacing the lever.

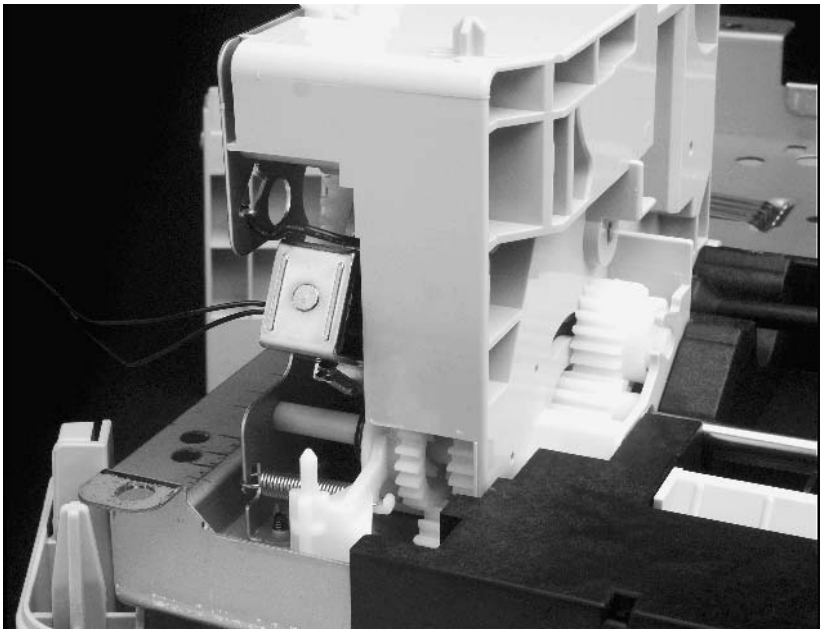

Figure 90. **Location of spring and lever (the paper feeder is inverted)**

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7 Troubleshooting

Chapter contents

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Troubleshooting process

The troubleshooting process is a systematic approach that addresses the major problems first, and then other problems, as you identify the causes for printer malfunctions and errors. The troubleshooting flowchart on page 185 illustrates the major steps for troubleshooting the printing system. Each heading depicts a major troubleshooting step.

The following list describes the basic questions for the customer and the corresponding troubleshooting step to help you quickly define the problem(s).

Table 35. Major steps for troubleshooting

"Power on" (page 188)	Does the printer power up and display a message? This section gives the procedures for correcting power supply problems.
"Display" (page 191)	Does the control panel indicate READY, OFFLINE, or POWERSAVE ON? This section gives the procedures for clearing control panel error messages.
"Event log" (page 191)	Are there recurring problems in the event log? This section gives information about printing the event log and evaluating the error history.
"Printer messages" (page 193)	Does the printer control panel display an error message? This section provides an alphabetical and numerical listing of the printer control panel messages, and gives the recommended actions to resolve the problem.
"General paper-path troubleshooting" (page 220)	Is there a jam in the printer? This section gives information about solving problems in the paper path.
"Information pages" (page 222)	Will the printer print information pages successfully? This section gives the procedures for printing the information pages and evaluating and correcting the printer's configuration.
"Image quality" (page 227)	Does the print quality meet the customer's expectations? This section gives toner cartridge checks, information about EconoMode, image defect examples, and the repetitive defect ruler.

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Troubleshooting flowchart

A “yes” answer to the questions below allows you to proceed to the next major step.

A “no” answer indicates that additional testing is needed. Proceed to the referenced location and follow the directions for that area. After completing the additional testing, proceed to the next major step.

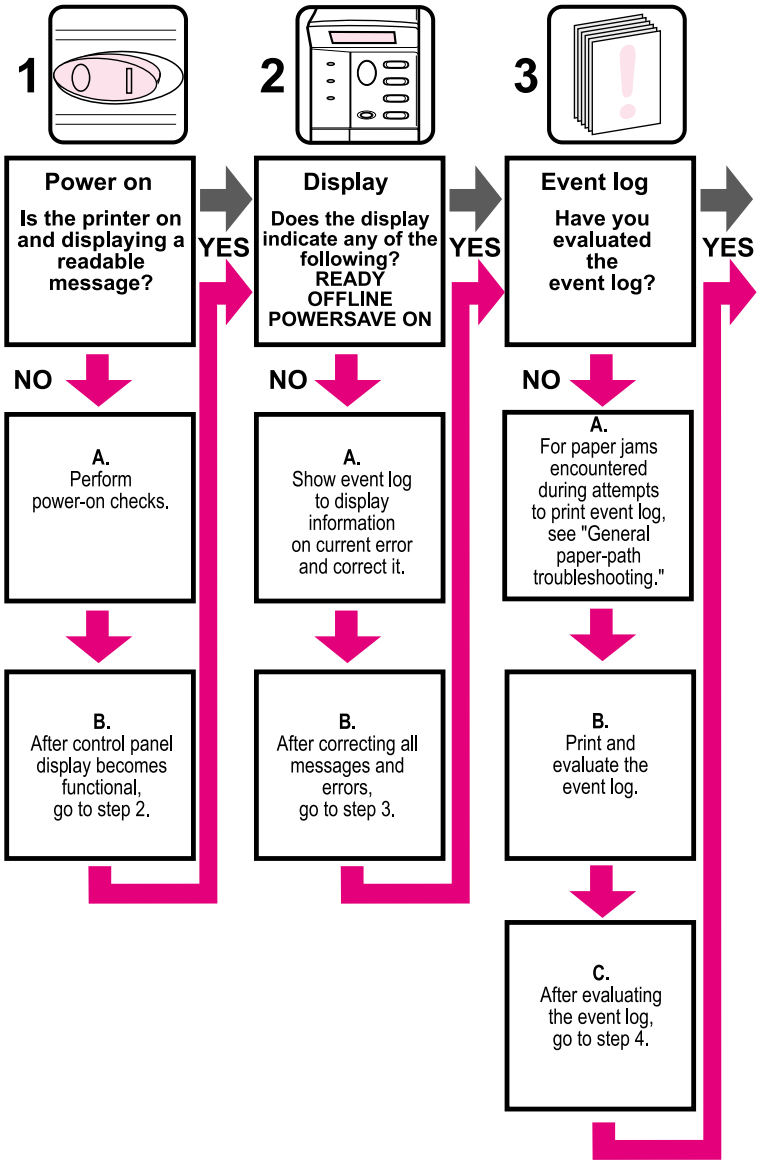

Figure 91. **Troubleshooting flowchart (1 of 2)**

Troubleshooting flowchart (continued)

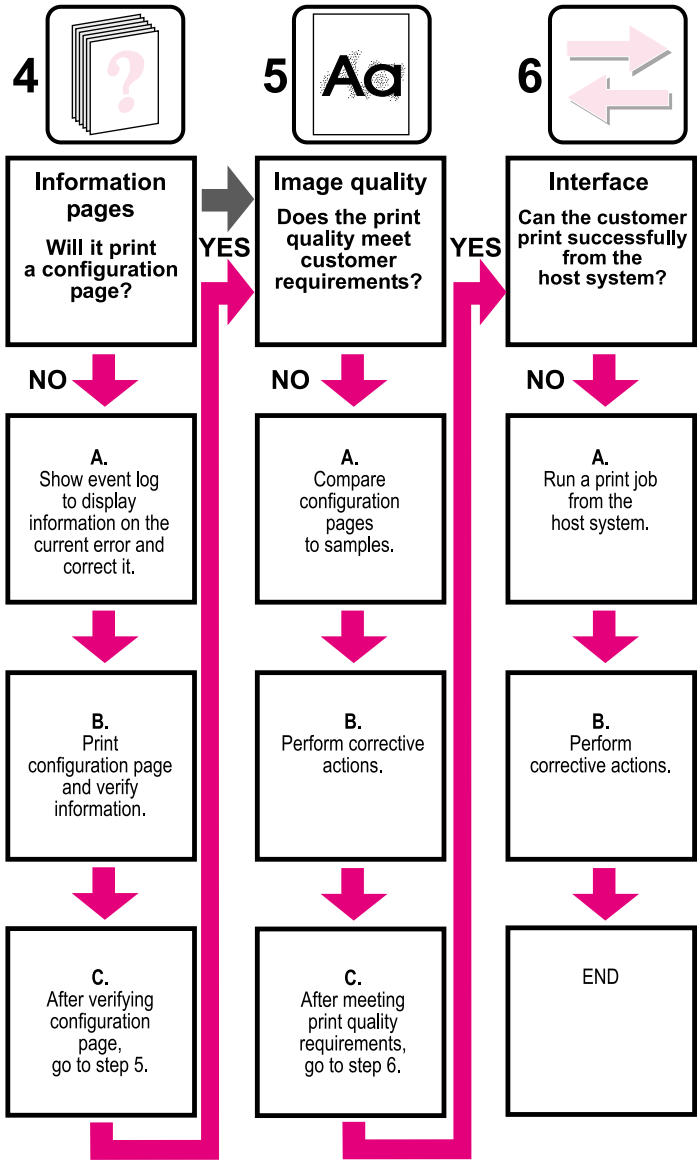
4
5
6
Information pages
Will it print a configuration page?
YES
Image quality
Does the print quality meet customer requirements?
YES
Interface
Can the customer print successfully from the host system?
NO
NO
NO
A. Show event log to display information on the current error and correct it.
B. Print configuration page and verify information.
C. After verifying configuration page, go to step 5.
A. Compare configuration pages to samples.
B. Perform corrective actions.
C. After meeting print quality requirements, go to step 6.
A. Run a print job from the host system.
B. Perform corrective actions.
END

Figure 92. **Troubleshooting flowchart, continued**

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Preliminary operating checks

Before troubleshooting a specific printer problem, you should ensure that:

- The printer is being maintained on a regular basis as described in chapter 4.
- The customer is using acceptable print media as specified in the *HP LaserJet Printer Family Print Media Guide*.
- The printer is positioned on a solid, level surface.
- The line voltage does not vary more than 10 percent from the nominal rated value as specified on the power rating label.
- The operating environment for the printer and paper is within the temperature and humidity specifications listed in chapter 1 of this manual.
- The printer is never exposed to ammonia fumes such as those produced by diazo copiers or office cleaning materials.
- The printer is not exposed to direct sunlight.
- Non-HP components (such as refilled toner cartridges, EIO accessories, and DIMMS) are removed from the printer.

Note When moving the printer into a warm room from a cold location such as a warehouse, various problems can occur as a result of condensation in the printer. Additionally, if the photosensitive drum is cold, the resistance of the photoconductive layer will be high. This will lead to incorrect contrast. Leave the printer running for 10 to 20 minutes before its first job.

Power on

Note It is important to have the printer control panel functional as soon as possible in the troubleshooting process so that the printer's diagnostics can assist in locating printing errors.

Table 36. Power on defect or blank display

Problem	Action
The power cord is not plugged into the wall outlet and the printer.	Make sure the power cord is firmly plugged into the printer and the outlet.
Proper AC power is not available.	Measure the voltage at the outlet. If necessary, plug the power cord into another AC circuit outlet.
The power switch is off.	Set the switch to the on position. You should hear the switch toggle. If the front right side cover has been removed recently, be sure that the rod leading to the power supply moves as the rocker switch is toggled. If the printer still does not turn on, the power switch might be defective. 1. Remove the engine controller board. 2. Measure the resistance between the two terminals of the power switch (SW1) by applying the tester probes to the terminals. The resistance must be low (under 1 KΩ) when the power is turned on, and high (over 6 MΩ) when the switch is turned off. 3. Replace the engine controller board, if necessary.
The overcurrent/ overvoltage detection circuit is activated.	Wait for more than two minutes before turning the printer back on.
A fuse is blown.	1. Check the fuses (FU1 and FU2) on the engine controller board. 2. Replace the fuses if necessary.

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Table 36. Power on defect or blank display (continued)

Problem	Action
The fan does not turn on when the printer is first powered up.	**Note** An operational fan indicates the following: 1. AC power is present in the printer. 2. DC power supply is functional (both 24 VDC and 3.5 VDC are being generated). 3. The engine controller board's microprocessor is functional. **If the fan is not working:** 1. Turn the printer off and remove the formatter. Disconnect the optional accessories. 2. Turn the printer on and check the fan again. If the fan is still not working, perform the following steps: 1. Verify that the fan is connected to the engine controller board. 2. Replace the fan. 3. Replace the engine controller board. **Note** The fan only operates during initial power on and while printing, unless the temperature inside the printer is too high. If the temperature is too high, the fan turns on to cool the inside of the printer.
The fan works, but the control panel display is blank.	1. Print an engine test. See “Engine test” on page 190. 2. If the engine test is successful, perform the following steps: a. Reseat the control panel and formatter connector. b. Replace the control panel assembly. c. Replace the firmware DIMM. d. Replace the cable from the control panel. 3. If the engine test is not successful, replace the engine controller board.

Engine test

The printer has a built-in test pattern (pairs of vertical lines). The test print can be made by pressing the test print switch located on the left side of the printer (see figure 93 on page 190) once—after the photosensitive drum has stopped and the printer has entered the standby mode. If the switch is held down, the test pattern is printed continuously. The switch can be used when paper is loaded in any tray other than tray 1.

The engine test:

- Verifies if the print engine is functioning correctly (the formatter is completely bypassed during an engine test)
- Is used for isolating printer problems
- Is used for checking and adjusting registration
- Prints from tray 2, 3, or 4 only, not from tray 1
- Can be activated with the formatter removed

Note For the printer to perform an engine test, tray 2, 3, or 4 must be installed and loaded with paper, and the toner cartridge must be installed in the printer.

Location of engine test button

The engine test button is located on the left side of the printer, below the fan vent, as shown figure 93 on page 190.

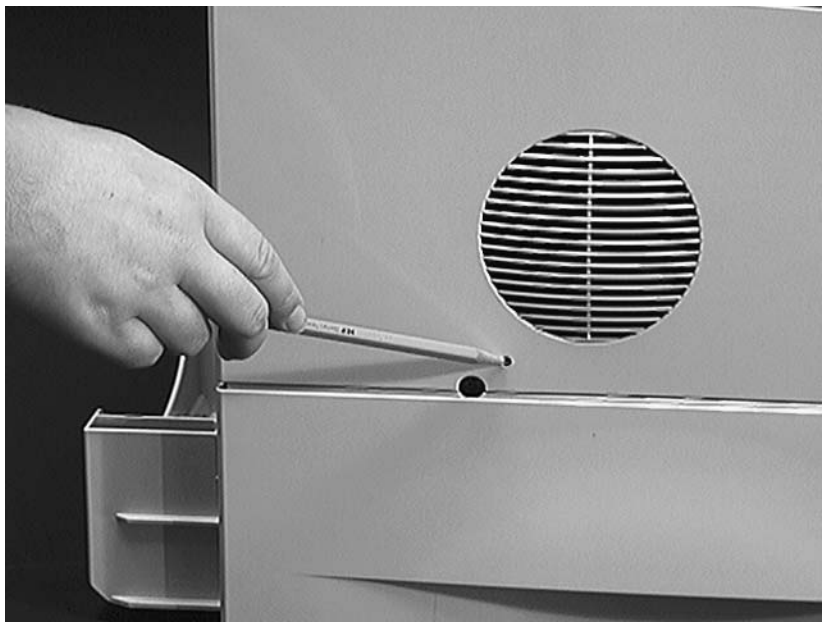

Figure 93. **Location of the engine test button**

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Display

The control panel should display READY, OFFLINE, or POWERSAVE ON. If the display is blank, see page 188. If an error message is displayed, refer to the printer messages table starting on page 194 and perform the necessary actions to correct the error condition.

Event log

Use the event log to diagnose and troubleshoot printer errors and intermittent failures. You can either display or print the event log.

Access the event log from the control panel information menu. (Select PRINT EVENT LOG or SHOW EVENT LOG.) The event log retains the printer's last 20 error messages.

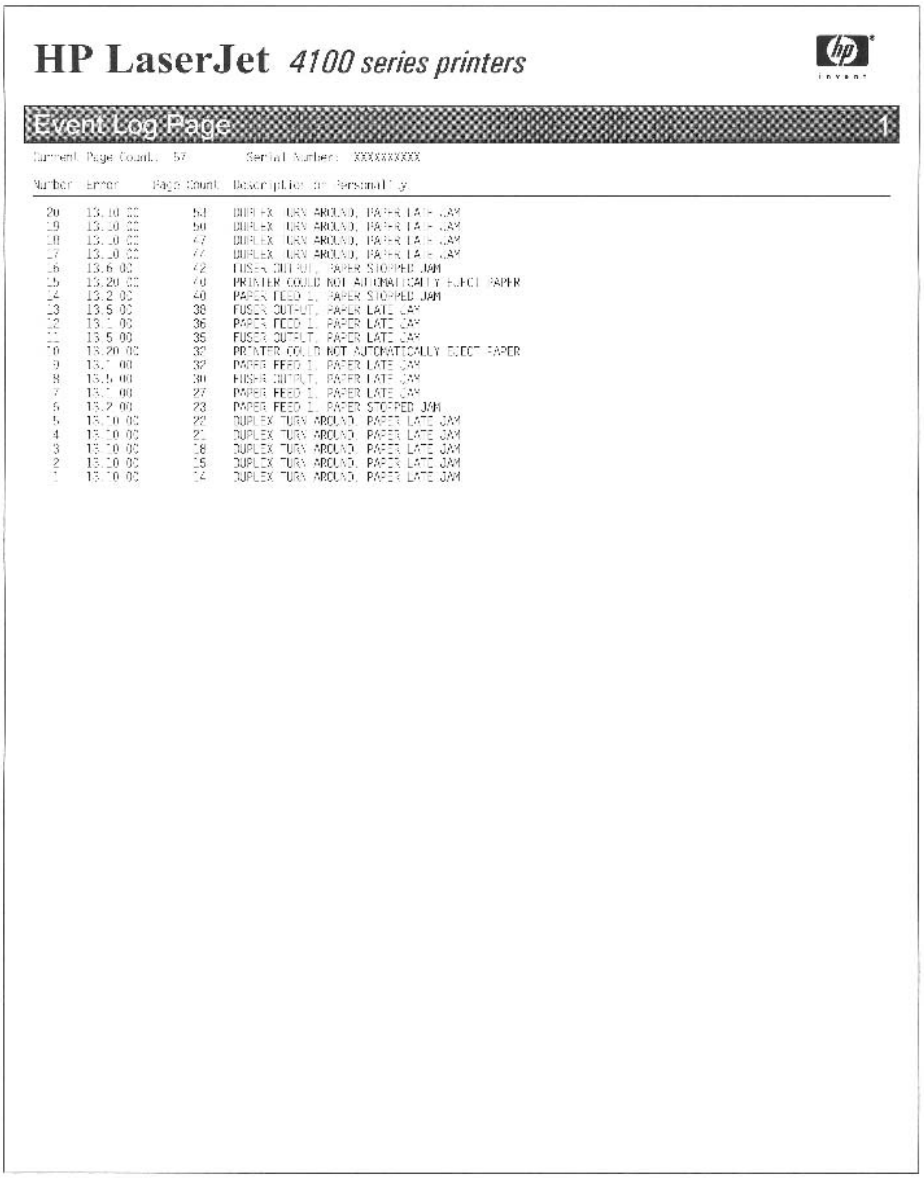

Figure 94. **Sample event log**

Print the event log

The printer's internal event log stores the last 20 errors and can be printed at any time. To print the event log:

1. Press MENU until INFORMATION MENU appears.
2. Press ITEM until PRINT EVENT LOG appears.
3. Press SELECT to print the event log.

Display the event log

If the printer cannot print or move any media, follow these steps to display the event log.

1. Press MENU until INFORMATION MENU appears.
2. Press ITEM until SHOW EVENT LOG appears.
3. Press SELECT to show the event log. The control panel will show the sequence, the error type, and the page count at which it occurred.
4. Press + to scroll through the event log.
5. Write down the error messages.
6. Check the event log for specific error trends in the last 10,000 printed pages.
7. Ask the customer for any observed error trends. (For example, do jams tend to occur in a specific area of the printer?)
8. Record any specific error trends.
9. If the control panel displays READY, OFFLINE, or POWERSAVE ON, go to the next section. If it displays any other message, refer to the printer messages table starting on page 194 and perform the necessary corrective action.

Interpret the event log

The event log is the key tool in troubleshooting printer problems. Figure 94 on page 191 shows a typical event log. The event log shows the current page count at the top left of the page with the printer's serial number directly to the right of the page count. The left column is the error sequence number (the highest sequence number is the most recent error logged). The second column is the error type. The next column is the page count at the time of the error, and the last column is the personality (PCL or PostScript) column or the cause of the jam at the time of the error.

To interpret the event log:

- Each individual entry in the log is called an "error," while all errors occurring at the same page count are called an "event." Read the recommended action for each error comprising an event to gain a clear picture of what took place during that event.
- Use the printer messages table in this section to associate errors in the event log with the control panel error message. Follow the recommended action listed in the table for each error or event.

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Printer messages

The following table explains messages that might appear on the printer control panel. Numerical and alphabetical printer messages and their meanings are listed in the following table.

Hint

If a message persists in requesting that you load a tray, or if a message indicates that a previous print job is still in the printer memory, press GO to print or press CANCEL JOB to clear the job from the printer memory.

Note

Not all messages are described (many are self-explanatory).

Some printer messages are affected by the auto-continue and clearable warning settings from the configuration menu in the printer control panel. If CLEARABLE WARNING=JOB is set on the control panel, warning messages remain on the control panel until the end of the job from which they were generated. If CLEARABLE WARNING=ON is set, warning messages appear on the control panel until GO is pressed. If an error occurs that prevents printing and AUTO CONTINUE=ON is set, the printer goes offline for 10 seconds before it returns online. If AUTO CONTINUE=OFF is set, the message remains until GO is pressed.

Table 37. Printer messages

Control panel message	Explanation	Recommended action
ACCESS DENIED MENUS LOCKED	The control panel function you are trying to use has been locked by the network administrator to prevent unauthorized access.	Ask the network administrator to unlock the function.
BAD DUPLEXER CONNECTION	The duplexer is not correctly installed.	1. Ensure that the right-angle power cord that shipped with the printer is being used. 2. Turn the printer off. 3. Remove and reinstall the duplexer. 4. Turn the printer off and back on. 5. If the message persists, make sure the duplexer is connected and the connector is not damaged. 6. Replace the duplexer.
BAD ENV FEEDER CONNECTION	The envelope feeder is not connected properly to the printer.	1. Remove and reinstall the envelope feeder. 2. Turn the printer off and back on. 3. Replace the envelope feeder.
BAD OPT TRAY CONNECTION	There is a problem with an optional 500-sheet paper tray connection with the printer: • The tray is not connected properly. • More than two optional 500-sheet paper trays have been installed (the printer cannot support more than four trays total). • The electronics in the paper tray are faulty.	1. Reinstall the optional tray. 2. Turn the printer off and back on. 3. Make sure the optional tray is connected and the connector is not damaged. 4. Replace the optional-tray or optional-feeder controller PCA.
CANNOT DUPLEX CLOSE REAR BIN	The printer cannot duplex because the rear output bin is open.	1. Close the rear output bin. 2. If the message persists, check sensor PS702 in the duplexer.

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Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
CHECK INPUT DEVICE alternates with PAPER PATH OPEN PLEASE CLOSE IT	The optional input tray cannot feed print media to the printer because a door or paper guide is open.	1. Check the doors and paper guides and close any that are open. 2. If doors and trays are closed, check tabs and sensor levers in the tray for proper operation. Replace any defective tabs or sensors. 3. Replace the PCA controller in the feeder.
CHECK OUTPUT DEVICE alternates with CLOSE OUTPUT DELIVERY PATH	The optional output device is not properly connected to the printer.	1. Ensure the optional output device is fully seated and properly installed. 2. Check any doors on the output device and verify they are closed.
CHECKING PAPER PATH	The engine is checking for possible jams or print media that was not cleared from the printer.	Wait for the printer to finish checking (up to 30 seconds).
CLOSE TOP COVER	The top cover is open and must be closed for printing to continue.	1. Close the top cover. 2. If the message persists, check SW101 for proper operation. (See page 263 for the sensor location.) Make sure wires are connected. 3. Replace SW101. 4. If the new switch does not solve the error, the wiring or the engine controller board might be defective.
DISK DEVICE FAILURE	The EIO disk had a critical failure or fatal error.	1. Reseat the EIO disk. 2. Remove the EIO disk and replace it with a new one.
DISK FILE OPERATION FAILED	The requested operation could not be performed (for example, attempting to download a file to a nonexistent directory).	1. Check the file name and the directory name. 2. Reseat the EIO disk. 3. Retry the operation.

Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
DISK FILE SYSTEM IS FULL	The disk file system is full.	1. Delete all unnecessary files from the EIO disk and then try again. Use HP Resource Manager to download or delete files and fonts. (See the software help for more information.) 2. Advise the customer to increase the permanent storage (use a larger EIO disk or add a RAM DIMM).
DISK IS WRITE PROTECTED	The EIO disk is protected, and no new files can be written to it.	Disable the write protection through HP Resource Manager.
DUPLEX ERROR CHECK DUPLEXER	There is a problem with the duplexer.	1. Make sure the duplexer is properly installed. 2. Make sure the right-angle power cord is used for the printer and the duplexer is making a good connection. 3. Replace the duplexer PCA.
EIO DISK [x] NOT FUNCTIONAL	The EIO disk is not working correctly.	1. Reseat the EIO disk in slot [X]. 2. Remove and replace the EIO disk in slot [X].
EIO [x] NOT FUNCTIONAL	The EIO disk is not working correctly.	1. Reseat the EIO disk in slot [X]. 2. Remove and replace the EIO disk in slot [X].
EIO [x] INITIALIZING alternates with DO NOT POWER OFF	The disk accessory in EIO slot [x] is initializing.	1. Wait for the message to disappear (up to five minutes). If the printer EIO card is operating correctly and communicating with the network, this message disappears after approximately one minute and no action is required. 2. If the EIO card is unable to communicate with the network, this message remains for five minutes and then disappears. The problem might be an unseated EIO card, a bad EIO card, a bad cable or connection on the network, or a network problem. 3. Contact the network administrator.

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Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
ENV FEEDER LOAD [TYPE] [SIZE]	A job has been sent to the envelope feeder and the feeder is empty, the wrong size is loaded in the feeder, or the type and size are set incorrectly on the control panel.	1. Load the requested envelope type and size into the envelope feeder. 2. Make sure the envelope size and type are set correctly from the paper-handling menu in the printer control panel. 3. Press GO if the desired envelope is already loaded in the feeder. 4. Press -VALUE+ to scroll through other available types and sizes. 5. Press SELECT to accept the alternate type or size.
ENVELOPE FEEDER SIZE = [xxxxx]	The printer is asking what size envelopes have been loaded in the envelope feeder.	In response, you can take either of the following actions: 1. Press SELECT to accept the current envelope size. 2. Press -VALUE+ to change the size and then press SELECT to accept the new size. If you do not press any buttons, the message disappears in about one minute. **Note** Changing the size here changes the default for the envelope-feeder size in the paper-handling menu.
ENVELOPE FEEDER TYPE = [xxxxx]	The printer has received a job under the following conditions: • The envelope type the job requested is not available in the printer. • Envelopes have been placed in the envelope feeder (thus triggering the paper sensor).	You can take either of the following actions: 1. Press SELECT to accept the paper type and then press GO. 2. Press +VALUE- to change the type, press SELECT to accept the new type, and then press GO to continue.
FLASH DEVICE FAILURE	The flash DIMM had a critical or fatal failure.	1. Reseat the flash DIMM and ensure it is locked into place. 2. Remove the flash DIMM and replace it with a new one.
FLASH FILE OPERATION FAILED	The requested operation could not be performed (for example, attempting to download a file to a nonexistent directory).	1. Check the file name and the directory name. 2. Reseat the flash DIMM. 3. Retry the operation.

Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
FLASH FILE SYSTEM IS FULL	The flash file system is full.	Delete unnecessary files from the flash DIMM and try again. Use HP Resource Manager to download or delete files and fonts. (See the software help for more information.)
FLASH IS WRITE PROTECTED	The flash DIMM is protected and no new files can be written to it.	Disable the write protection through HP Resource Manager.
INPUT DEVICE CONDITION [XX.YY]	An input paper-handling device has a condition that needs attention before printing can resume. 1st X = Device number in chain 2nd X= Device type (three types): 1 = Input 2 = Output 3 = Stapler/stacker unit YY = Device specific error	1. Turn the printer off. 2. Disconnect the cable to the input paper handling devices and then reconnect it. 3. Ensure the device is properly connected and any doors or paper guides are properly closed. 4. Turn the printer on. 5. See the documentation that came with the paper-handling device for assistance.
INSTALL DUPLEXER	The printer is unable to print the current job because the duplexer is not installed or not inserted correctly.	1. Install or reinsert the duplexer and ensure it is fully seated. 2. Ensure the right-angle power cord is used for the printer.
INSTALL TONER CARTRIDGE	The toner cartridge has been removed and must be reinstalled for printing to continue.	Reinstall the toner cartridge and ensure it is fully seated.
INSTALL TRAY [X]	The printer is unable to print the current job because the specified tray [X] is open or not inserted correctly.	1. Reinsert the specified tray. 2. Check for damaged tabs on the right side of the tray. 3. Check for damaged tray sensor switches in the printer. 4. Replace the PCA controller in the feeder.

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Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
LOADING PROGRAM [NUMBER] alternates with DO NOT POWER OFF	Programs and fonts can be stored on the printer's file system. At startup time, these entities are loaded into RAM. (These entities can take a long time to load into RAM depending on the size and number of entities being loaded.) The <NUMBER> specifies a sequence number indicating the current program being loaded.	Wait for the program to load.
MANUALLY FEED [TYPE] [SIZE]	One of the following occurred: • A manual feed was requested. • There is no media in tray 1. • The wrong size of media is loaded. • The control panel is not set for the size and type of media loaded.	1. Load the requested paper into tray 1. 2. Press GO if the desired paper is already loaded in tray 1. 3. Press -VALUE+ to scroll through other available types and sizes. 4. Press SELECT to accept the alternate type or size.
MEMORY FULL STORED DATA LOST	There is no available memory in the printer. The current job might not print correctly and some resources (such as downloaded fonts or macros) might have been deleted.	Advise the customer to add more memory to the printer or to simplify the print job.
MEMORY SETTINGS CHANGED	The printer changed its memory settings because it did not have enough memory to use the previous settings for I/O buffering and resource saving. This usually occurs after removing memory from the printer, adding a duplexer, or adding a printer language.	Advise the customer to add more memory to the printer or to simplify the print job.

Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
MEMORY SHORTAGE JOB CLEARED	The printer did not have enough free memory to print the entire job. The remainder of the job will not print and will be cleared from memory.	1. Press Go to continue. 2. Advise the customer to add more memory to the printer or to simplify the print job.
MEMORY SHORTAGE PAGE SIMPLIFIED	The printer had to compress the job to fit it in available memory. Some data loss might have occurred.	1. Press Go to continue. (The print quality of these pages might not be acceptable.) 2. Advise the customer to add more memory to the printer or to simplify the print job.
NON HP TONER DETECTED alternates with PRESS GO TO CONTINUE	The printer has detected that the toner cartridge is not a genuine HP toner cartridge because it does not see or recognize the toner cartridge's identification (model, manufacturing date, and serial number).	1. Make sure the toner cartridge is a genuine HP toner cartridge. A non-HP toner cartridge will produce this error. Any printer repair required as a result of using non-HP toner is not covered under the printer warranty. 2. If the HP toner cartridge is new, the Elabel (cartridge memory) is missing or has been tampered with. If you believe the toner cartridge is a fraud, call the HP fraud hotline at (1) (877) 219-3183 (toll-free in North America). 3. If the HP toner cartridge is used, the printer will not recognize the cartridge until 20 pages have been printed. After 20 pages have been printed, the error message disappears. 4. If the HP toner cartridge is used, and the error message remains after 20 pages have been printed, the cartridge has previously run out of toner. Replace the toner cartridge.
OFFLINE	The printer is offline.	Press Go to place the printer online.
OUTPUT BIN FULL alternates with CLEAR PAPER FROM [BINNAME]	The output bin is full and needs to be emptied.	Remove the sheets from the output bin.

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Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
PAPER WRAPPED AROUND FUSER	Print media is wrapped around the fuser.	1. Turn the printer off to keep the media from wrapping more firmly around the fuser. 2. Open the top cover and remove the toner cartridge. 3. Remove all the visible media. 4. Leave the printer turned off and remove the fuser to remove any remaining print media.
PERFORM PRINTER MAINTENANCE	To ensure optimum print quality, the printer prompts the customer to have routine maintenance performed every 200,000 pages.	Install the printer maintenance kit. You must reset the maintenance page count after performing printer maintenance by pressing ITEM- and VALUE- while turning the printer on. **Note** The printer maintenance kit is a consumable item and is not covered under warranty.
PROCESSING JOB	The printer is processing a job.	Wait for the job to finish. This can take several minutes for a complex print job.
PROCESSING CLEANING PAGE	The printer is conducting the manual cleaning-page process.	Wait for the job to finish. This can take up to 2.5 minutes.
RAM DISK DEVICE FAILURE	The RAM disk had a critical or fatal failure.	1. Reseat the RAM disk. 2. Replace the RAM disk.
RAM DISK FILE OPERATION FAILED	The requested operation could not be performed (for example, attempting to download a file to a non-existent directory).	1. Check the filename and directory name. 2. Reseat the RAM disk. 3. Retry the operation.

Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
RAM DISK FILE SYSTEM IS FULL	The RAM disk file system is full.	1. Delete unnecessary files and then try again, or turn the printer off, and then turn the printer on to delete all files on the device. (Delete files using HP Resource Manager or another software utility. See the software online help for more information.) 2. If the message persists, increase the size of the RAM disk. Change the RAM disk size from the configuration menu on the printer control panel. HP Resource Manager can also be used to increase or decrease the RAM disk size.
RAM DISK IS WRITE PROTECTED	The RAM disk is protected, and no new files can be written to it.	Disable the write protection through HP JetAdmin.
TONER LOW	The message first appears when about 15 percent of the toner is remaining in the toner cartridge (about 1,500 pages remaining for the 10,000-page cartridge and about 900 pages remaining for the 6,000-page cartridge at five percent coverage). Depending on how the printer has been configured in the configuration menu, it will either continue to print or stop.	1. If the printer has stopped, you can resume printing by pressing Go for each job. 2. Advise the customer to have a replacement toner cartridge on hand.
TONER OUT	The toner cartridge has run out of toner. Depending on how the printer has been configured, it will either continue to print or stop. Due to the resolution of the toner level sensor, it is possible that a small amount of toner (less than one percent) might still be present in the cartridge.	1. If the printer has stopped, you can resume printing by pressing Go for each job. 2. Replace the toner cartridge.

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Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
TRAY [X] EMPTY [TYPE] [SIZE]	The specified tray is empty, but the current job does not need this tray in order to print correctly. If this message appears and the tray contains print media, a sensor could be damaged. PS105 detects paper in tray 1. PS101 detects paper in tray 2. PS1001 detects paper in the optional 500-sheet feeder. See figure 113 on page 263 and figure 114 on page 264 for sensor locations.	1. Load the empty tray (x) to clear the message. If you do not load the specified tray, the printer will continue printing from the next available tray, and the message remains. 2. If the message remains after the specified tray is loaded, check sensor arm flags for damage and be sure they move freely. 4. Replace defective paper out sensors.
TRAY [x] LOAD [TYPE] [SIZE] where **x** is tray 2, 3, or 4	This message occurs for the following reasons: • Tray 2, 3, or 4 was requested, but the tray is empty. • Tray 2, 3, or 4 was requested, but the adjustments are not set for the requested type or size.	1. Make sure that all three paper size adjustments have been made (see the explanation of adjustments in table 39 on page 220). Also make sure that the type has been set at the control panel. 2. Load the requested media into an indicated tray. Ensure the tray is fully seated. 3. If you are trying to print on A4- or letter-size media and this message appears, make sure the default paper size is set correctly from the printing menu in the printer control panel and also in the software program. 4. Press GO to print from the next available tray. 5. Press -VALUE+ to scroll through the available types and sizes. 6. Press SELECT to accept the alternate type or size.

Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
TRAY 1 LOAD [TYPE] [SIZE]	The print job has requested a size and/or type of media that is not loaded.	1. Load the requested print media into tray 1 (or any other desired tray). • Ensure that the trays are correctly adjusted for size. • The tray type settings (and size for tray 1) must be set from the paper-handling menu. 2. If you are trying to print A4- or letter-size media and this message appears, make sure the default paper size is set correctly from the printing menu in the printer control panel. 3. If this message appears and the correct media is loaded: • Ensure that all paper size adjustments have been properly performed (see page 220). • Ensure the tray type setting is correct in the paper-handling menu. • Check the size tabs on the right side of the tray. • Check the size switches and paper sensors. • Ensure the tray is fully seated. 4. To print on a different media that is already loaded: a. Press GO to print from the next available tray. b. Press -VALUE+ to scroll through the available types and sizes. c. Press SELECT to accept the alternate type or size. d. Inspect the switches in the tray. e. Turn the printer on with the tray removed and push the switches by hand to see if they register. See “Paper-size detection switches” on page 255.

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Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
TRAY 1 SIZE = [xxxx]	The printer is asking what size of media has been loaded in tray 1.	In response, you can take either of the following actions: 1. Press SELECT to accept the paper size. 2. Press -VALUE+ to change the size and then press SELECT to accept the new size. The printer will first display the TRAY 1 TYPE = XXXX message (see the description of that message). If you do not press any buttons in the time-out period (about one minute), it displays this TRAY 1 SIZE = XXXX message. Changing the size here changes the default for tray 1 paper size in the paper-handling menu.
TRAY 1 TYPE = [xxxx]	The printer has received a job under the three following conditions: • The media type requested by the job is not available in the printer. • Tray 1 has been set for CASSETTE. • Media has been placed in tray 1 (thus triggering tray 1's paper sensor). If you do not press any buttons, the message disappears in about one minute).	You can take either of the following actions: 1. Press SELECT to accept the paper type. 2. Press -VALUE+ to change the type and then press SELECT to select the new type. **Note** Changing the type here changes the default for tray 1 media type in the paper-handling menu. If you do not do anything during the time-out period (about one minute), the printer will print on the media in tray 1.
UNABLE TO MOPY JOB	Memory or file system failures would not allow a mopy job to occur. Only one copy will be produced.	1. Reseat RAM DIMMs and/or the EIO hard disk. 2. Install additional memory or an EIO hard disk.
UNABLE TO STORE JOB	Memory or file system failures would not allow the print to store the job.	1. Reseat RAM DIMMs and/or the EIO hard disk. 2. Install additional memory or an EIO hard disk.

Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
UNSUPPORTED SIZE IN TRAY [yy]	An external paper-handling device detected an unsupported media size. The printer will go offline until the condition is corrected.	Verify the media meets the supported size specifications in table 7 on page 26.
USE [TYPE] [SIZE] INSTEAD?	If the requested media size or type is not loaded, the printer asks if it should use another size or type instead.	1. Press -VALUE+ to scroll through the available types and sizes. 2. Press SELECT to accept the alternate type or size.
WAIT FOR PRINTER TO REINITIALIZE	The RAM disk setting has been changed from the printer control panel. This change will not take effect until the printer reinitializes.	If you change the mode of the external device, turn the printer off, turn the printer on and wait for the printer to reinitialize.
xx.yy PRINTER ERROR PRESS GO TO CONTINUE	A printer error has occurred that can be cleared by pressing GO on the printer control panel.	Press GO on the printer control panel.
13.XX PAPER JAM [LOCATION]	Media is jammed at the specified location (and possibly at other locations). If the message persists after all jams have been cleared, a sensor or sensor lever might be stuck or broken.	For all jam messages, do the following: 1. Remove jammed print media from the specified location. Check the entire paper path for other pieces of media in the path. 2. Open and close the top cover to clear the message. 3. If the jam reoccurs, see “General paper-path troubleshooting” on page 220. 4. Check sensors and flags in the paper path for proper operation. For sensor locations, see page 263.

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Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
13.0 PAPER JAM [LOCATION]	A non-specific paper jam occurred.	1. Remove jammed media from the specified location. 2. Verify the paper tray is fully closed. 3. Inspect and/or replace the feed and separation rollers. 4. Ensure there is no obstruction in the path, such as a torn piece of paper. 5. Open and close the top cover to clear the message. 6. Check sensors and flags for proper operation (page 263).
13.1 PAPER JAM OPEN INPUT TRAYS	Paper-delay jam at paper-feed area.	1. Ensure that paper trays are loaded and adjusted properly so media can feed from the tray. It might be necessary to reduce the stack height of media in the tray. 2. Check the input area for obstructions such as media in the path. Also check to see if the registration assembly damaged or unseated. 3. Check PS102 and PS103 for proper operation. Replace any defective sensors or flags. For sensor locations, see page 263. 4. Verify the media meets the specifications in table 6 and table 7 (page 25 and page 26). 5. Check the pickup feed and separation rollers for unusual wear. Replace as needed. 6. Rotate the media in the input tray by 180° and/or turn it over.

Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
13.2 PAPER JAM OPEN INPUT TRAYS	Paper-stopped jam at paper-feed area.	1. Check the input area for obstructions such as paper in the path. Also check to see if the registration assembly is damaged or if the transfer roller is out of place. 2. Check PS102 and PS103 for proper operation. Replace any defective sensors or flags. For sensor locations, see page 263. 3. Ensure the media does not exceed the maximum length (356 mm/14 inches). 4. If multiple sheets are feeding, it might be necessary to fan the media and reduce the stack height. 5. Verify that the fuser is properly installed.
13.5 PAPER JAM CHECK REAR DOOR alternates with OPEN AND CLOSE TOP COVER	Paper-delay jam at fuser.	1. Check the transfer roller and small media belt to ensure they are operating and can feed print media. 2. Check the paper path for obstructions at the transfer roller, toner cartridge, paper feed assembly, and fuser. 3. Check PS107 and PS108 for proper operation. Replace any defective sensors or flags. For sensor locations, see page 263. 4. Turn the media stack over and/or rotate it by 180° in the input tray.
13.6 PAPER JAM CHECK REAR DOOR alternates with OPEN AND CLOSE TOP COVER	Paper-stopped jam at fuser.	1. Check the paper path for obstructions at the fuser and output/delivery area. 3. Check PS107 and PS108 for proper operation. Replace any defective sensors or flags. For sensor locations, see page 263.
13.10 PAPER JAM CHECK DUPLEXER alternates with OPEN AND CLOSE TOP COVER	Jam at duplexer.	1. Check the duplexer and the rear area of the printer for obstructions or damage. 2. Check PS701 and PS703 in the duplexer for proper operation. Replace the duplexer if a sensor is defective.

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Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
13.20 PAPER JAM CHECK REAR DOOR alternates with OPEN AND CLOSE TOP COVER OPEN INPUT TRAYS	Media stopped in the paper path during power-on or when the top door was closed.	1. Remove all media in the paper path, and then open and close the top cover. 2. If the message persists after all media is removed: • Check if media is jammed in the prefeed area (PS102). • Check PS102, PS103, PS107, and PS108 for proper operation. Replace any defective sensors or flags (see page 263).
13.21 DOOR OPEN JAM	The top cover was open while printing.	1. Clear the jam and close the top door. 2. If the message persists, check the top door switch (SW101) for proper operation.
13.99 PAPER JAM [LOCATION]	A non-specific paper jam occurred.	1. Remove jammed media from the specified location. 2. Verify the paper tray is fully closed. 3. Inspect and/or replace the feed and separation rollers. 4. Ensure there is no obstruction in the path, such as a torn piece of paper. 5. Open and close the top cover to clear the message. 6. Check sensors and flags for proper operation (page 263).
20 INSUFFICIENT MEMORY alternates with PRESS GO TO CONTINUE	The printer received more data than can fit in available memory. You might have tried to transfer too many macros, soft fonts, or complex graphics.	Press Go to print the transferred data (some data might be lost). Advise the customer to simplify the print job or install additional memory.
21 PAGE TOO COMPLEX alternates with PRESS GO TO CONTINUE	The data (dense text, rules, raster or vector graphics) sent to the printer is too complex.	Press Go to print the transferred data. (Some data might be lost.) Advise the customer to simplify the print job.
40 EIO x BAD TRANSMISSION alternates with PRESS GO TO CONTINUE	The connection has been broken between the printer and the EIO card in the specified slot. (Data loss might occur in this situation.)	1. Press Go to clear the error message and continue printing. 2. Reseat the EIO card in slot [X].

Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
41.x PRINTER ERROR alternates with PRESS GO TO CONTINUE	A temporary printing error has occurred.	Press Go. The page containing the error will automatically be reprinted. If the error persists: 1. Reseat the connections to the laser scanner and then to the engine controller board. 2. Replace the laser scanner. 3. Replace the engine controller board.
41.3 UNEXPECTED PAPER SIZE alternates with LOAD TRAY [X] TYPE SIZE	The printer detected a media size different from what it was expecting. This is typically caused if two or more sheets stick together in the printer or if the tray is not properly adjusted.	1. Reload the tray with the correct print media size. 2. Ensure that media in the tray is loaded under the front and back tabs. Check sensors PS103 and PS106 for proper operation. 3. If you are printing from tray 1, verify that the correct paper size is selected in the control panel. 4. If you are printing from tray 2, 3, or 4, verify that the three paper-size adjustments (length guide, width guide, size-selector switch) on the paper tray have been made correctly. Make sure the media is under the corner tabs. 5. After performing the actions above, press Go. The page containing the error will automatically be reprinted if jam recovery is enabled. (Or, you might want to press CANCEL JOB to clear the job from the printer's memory.)
41.5 PRINTER ERROR	The media reached the PS102 or PS103 sensor too early.	1. This error usually occurs with smooth media, such as transparencies or labels. • If the problem persists when using tray 1, load media one sheet at a time. • If the problem persists when using trays 3 and 4, replace the feed and separation rollers. 2. Check sensors PS102 and PS103 for proper operation.

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Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
49.XX PRINTER ERROR alternates with CYCLE POWER TO CONTINUE	A firmware error occurred.	1. Press CANCEL JOB to clear the print job from the printer memory. 2. Turn the printer off, and then turn the printer on. 3. Try printing a job from a different software application. If the job prints, go back to the first application and try printing a different file. (If the message only appears with a certain software application or print job, contact the software vendor for assistance.) 4. If the message persists with different software applications and print jobs, disconnect all cables to the printer that connect it to the network or printer. 5. Turn the printer off. 6. Remove all memory DIMMs or third-party DIMMs from the printer. (Do not remove the firmware DIMM in the lowest DIMM slot.) 7. Remove all EIO devices from the printer. 8. Turn the printer on. 9. If the error no longer exists, install each DIMM and EIO device one at a time, making sure to turn the printer off and back on as you install each device. 10. Replace a DIMM or EIO device if you determine that it causes the error. 11. Remember to reconnect all cables that connect the printer to the network or computer. 12. If the error persists, replace the firmware DIMM. 13. Replace the formatter.

Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
50.X FUSER ERROR	A fuser error has occurred. X description: 1 = Low fuser temperature 2 = Fuser warm-up service 3 = High fuser temperature	1. Turn the printer off, wait 20 minutes, and then turn the printer on. 2. If the message persists, reseat the fuser. • If that does not work, replace the fuser. • To check the fuser, turn the printer off and remove the fuser. Measure the resistance between the fuser connectors J132-1 and J132-2. If it is not within the range of 200 kΩ to 500 kΩ, replace the fuser. • If there is not continuity between the fuser connectors J143F (neutral) and J142F (hot) with the fuser removed, replace the fuser. • If the problem is not related to the fuser, replace the engine controller board.
50.4 PRINTER ERROR alternates with CYCLE POWER TO CONTINUE	A problem exists with the customer's line voltage.	1. Remove the printer from any UPS supplies, additional power supplies, or power strips. 2. Plug the printer into a wall outlet and see if this resolves the problem. 3. If the printer is already plugged into a wall outlet, try another power source in the building that is independent of the one currently being used. 4. The line voltage and current source at the printer location might need to be inspected to ensure that it meets the printer's electrical specifications.
51.X PRINTER ERROR alternates with CYCLE POWER TO CONTINUE	A loss of beam-detect occurred. X description: 1 = Beam-detect error 2 = Laser error	1. Press Go. The page containing the error will automatically be reprinted. 2. Turn the printer off and then on. 3. Reseat cables to the laser/scanner and engine controller. 4. Replace the laser/scanner.

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Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
52.X PRINTER ERROR alternates with CYCLE POWER TO CONTINUE	The laser scanner speed is incorrect. X description: 1 = Scanner startup error 2 = Scanner rotation error	1. Press Go. The page containing the error will automatically be reprinted. 2. Turn the printer off and then on. 3. Reseat cables to the laser/scanner and engine controller. 4. Replace the laser/scanner.
53.XY.ZZ PRINTER ERROR	There is a memory error with an accessory. The DIMM that caused the error will not be used. Values of X, Y, and ZZ are as follows: X = DIMM type 0 = ROM 1 = RAM Y = Device location 0 = internal memory (ROM or RAM) 1 to 4 = DIMM slots 1, 2, 3, or 4 ZZ = Error number 0, 1, 2 = Unsupported o unrecognized memory 3 = Failed RAM test 4, 5 = Exceeded maximum RAM or ROM size 6 = Invalid DIMM speed 7 = DIMM reporting information incorrectly 8 = DIMM RAM parity error 9 = ROM needs to be mapped to an unsupported address 10 = DIMM address conflict 11 = PDC XROM out of bounds 12 = Unable to make a temporary mapping	1. Turn the printer off, and reseat or replace the specified DIMM. 2. Try the DIMM in another slot. (The firmware DIMM must remain in slot #4—the lowest DIMM slot.) 3. Replace the DIMM that caused the error.
54.1 REMOVE SEALING TAPE alternates with FROM TONER CARTRIDGE	The toner cartridge has been installed without removing the sealing tape.	1. Open the top cover and remove the toner cartridge. 2. Pull the sealing tape tab to remove the strip. 3. Reinstall the toner cartridge and close the top cover.

Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
54.4 PRINTER ERROR alternates with CYCLE POWER TO CONTINUE	A problem exists with the customer's line voltage.	1. Remove the printer from any UPS supplies, additional power supplies, or power strips. 2. Plug the printer into a wall outlet and see if this resolves the problem. 3. If the printer is already plugged into a wall outlet, try another power source in the building that is independent of the one currently being used. 4. The line voltage and current source at the printer location might need to be inspected to ensure that it meets the printer's electrical specifications.
55.xx PRINTER ERROR alternates with CYCLE POWER TO CONTINUE	An internal communications error occurred.	The page containing the error will automatically be reprinted. 1. Check the power at the customer's location. 2. Replace the formatter and/or firmware DIMM. 4. Replace the engine controller board.
56.X PRINTER ERROR alternates with CYCLE POWER TO CONTINUE	An incompatible combination of input/ output bins was selected. X = description: 1 = Illegal input or bad accessory connector 2 - Illegal output	The page containing the error will automatically be reprinted. 1. Turn the printer off, and then turn the printer on. 2. Check the printer's configuration. 3. Verify accessory connection.
57.X PRINTER ERROR alternates with CYCLE POWER TO CONTINUE	A fan failure was detected. X description: 4 = Printer fan 7 = Duplex fan	1. Check the fan's connector and make sure the fan is not blocked. 2. Replace the fan.
58.2 PRINTER ERROR alternates with CYCLE POWER TO CONTINUE	An environmental thermistor (TH3) failure occurred.	1. Turn the printer off, and then turn the printer on. 2. Verify the environmental thermistor cable is securely connected. 3. Replace the environmental thermistor. 4. If the error persists, replace the engine controller board.

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Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
59.X PRINTER ERROR alternates with CYCLE POWER TO CONTINUE	A main motor error occurred. X description: 0 = Motor error 1 = Motor startup error 2 = Motor rotation error	1. Turn the printer off, and then turn the printer on. 2. Check and reseat the fuser and toner cartridge to make sure they are not hindering gear movement in the drive train. 3. Check the main motor's cable to ensure that it is seated properly. 4. If the error persists, replace the main motor.
62.X PRINTER ERROR	There is a problem with the printer memory. The X value refers to the location of the problem: 0 = Internal memory 1 to 4 = DIMM slots 1, 2, 3, or 4	1. Reseat the specified DIMM. 2. Replace the specified DIMM.
64 PRINTER ERROR alternates with CYCLE POWER	A scan buffer error occurred.	1. Turn the printer off, and then turn the printer on. 2. Perform a cold reset. 3. If the message persists, replace the formatter or firmware DIMM.
66.XX.YY [TYPE] FAILURE alternates with CHECK CABLES AND CYCLE POWER	An error occurred in an external paper-handling device. 1st X = Device number in chain 2nd X = Device type 1 Input 2 Output 3 Stapler/stacker unit YY = Device specific error	Press Go to clear the message. If the message will not clear: 1. Turn the printer off, and then turn the printer on. 3. Check and reseat all cables between the printer and the specified device. 4. Reseat the external paper-handling device.
68 NVRAM ERROR CHECK SETTINGS	An error occurred in the printer non-volatile memory (NVRAM) and one or more printer settings has been reset to its factory default.	1. Print a configuration page and check the printer settings to determine which values have changed. 2. Hold down Cancel Job while turning the printer on. This will clean up the NVRAM by removing old areas that are not being used.

Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
68 NVRAM FULL CHECK SETTINGS	An error occurred in the printer's NVRAM and one or more printer settings has been reset to its factory default.	1. Print a configuration page and check the printer settings to determine which values have changed. 2. Hold down CANCEL JOB while turning the printer on. This will clean up the NVRAM by removing old areas that are not being used.
68.X PERMANENT STORAGE ERROR alternates with CHECK SETTINGS	An error occurred in the printer's permanent storage and one or more printer settings has been reset to its factory default.	Print a configuration page and check the printer settings to determine which values have changed.
68.X PERMANENT STORAGE FULL	The printer's permanent storage is full. Some settings might have been reset to the factory defaults.	1. Print a configuration page and check the printer settings to determine which values have changed. 2. Hold down CANCEL JOB while turning the printer on. This will clean up the permanent storage by removing old areas that are not being used.
69.X PRINTER ERROR alternates with CYCLE POWER TO CONTINUE	A temporary printing error occurred. X description: 0 = The duplex mechanism has failed	1. Turn the printer off, and then turn the printer on. 2. Reseat the duplexer. 3. Replace the duplexer.

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Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
79 SERVICE [XXXX]	The printer detected an error.	1. Press CANCEL JOB to clear the print job from the printer memory. 2. Turn the printer off, and then turn the printer on. 3. Try printing a job from a different software application. If the job prints, go back to the first application and try printing a different file. (If the message only appears with a certain software application or print job, contact the software vendor for assistance.) 4. If the message persists with different software applications and print jobs, disconnect all cables to the printer that connect it to the network or printer. 5. Turn the printer off. 6. Remove all memory DIMMs or third-party DIMMs from the printer. (Do not remove the firmware DIMM in the lowest DIMM slot.) 7. Remove all EIO devices from the printer. 8. Turn the printer on. 9. If the error no longer exists, install each DIMM and EIO device one at a time, making sure to turn the printer off and back on as you install each device. 10. Replace a DIMM or EIO device if you determine that it causes the error. 11. Remember to reconnect all cables that connect the printer to the network or computer. 12. If the error persists, replace the firmware DIMM. 13. Replace the formatter.

Table 37. Printer messages (continued)

Control panel message	Explanation	Recommended action
8X.YYYY EIO [Z] ERROR	The EIO accessory in slot [z] has encountered a critical error. [z] description: 1 = EIO slot 1—The printer detected an error with the EIO accessory. 2 = EIO slot 2—The printer detected an error with the EIO accessory. 6 = EIO slot 1—The EIO accessory detected an error. 7 = EIO slot 2—The EIO accessory detected an error.	1. Turn the printer off, and then turn the printer on. 2. Turn the printer off, reseat the EIO accessory in slot [z], and then turn the printer on. 3. Turn the printer off, remove the EIO accessory from slot [z], install it in a different EIO slot, and turn the printer on. 4. Replace the EIO accessory in slot [z].

The following table lists the disk-error numbers reported on either the printer collation or job storage disk-error page, which is printed when an error exists.

Table 38. Mopy disk error messages

Disk error number	Error description	Solution
1	Disk volume not present–it might be uninitialized	Hard disk: Initialize the hard disk. If the problem persists, replace the hard disk. RAM disk: Turn the printer off, and then turn the printer on.
3	A requested file or directory could not be found	The data might be corrupted. Delete the job that prompted the error.
5	Invalid number of bytes given in a read/write request	The data might be corrupted. Delete the job that prompted the error.
6	Attempt to create a file or directory that already exists	The user has sent a username that is the same as an existing directory. Change the username in the driver and resend the job.
15	Bad disk	Hard disk: Initialize the hard disk. If the problem persists, replace the hard disk.
16	No volume label	Hard disk: Initialize the hard disk. If the problem persists, replace the hard disk.
23	Bad seek request–the resulting offset would be negative	The data might be corrupted. Delete the job that prompted the error.

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Table 38. Mopy disk error messages

Disk error number	Error description	Solution
24	Unexpected internal error	The data might be corrupted. Delete the job that prompted the error. Disk-media problem: Initialize the hard disk or restart the printer to reinitialize the RAM disk. If the problem persists on a hard disk, replace the hard disk.
55	Bad file system	Data might be corrupted. Delete the job that prompted the error. Disk-media problem: Initialize the hard disk or restart the printer to reinitialize the RAM disk. If the problem persists on a hard disk, replace the hard disk.
56	Hardware failure	Replace the hard disk.
59	The maximum number of directories has been reached	A maximum number of directories can be put on a disk. Stored jobs are stored in directories created for each user. To solve this problem: 1. Delete all jobs stored for a user. The firmware will automatically delete the directory for a user with no stored jobs. 2. Delete other directories on the disk.
70	Disk error	1. Reseat the disk. 2. Replace the disk.

General paper-path troubleshooting

Jams occur in the printer when print media does not either reach or clear a photosensor along the printer paper path in a specific amount of time. If a jam occurs, a `13.XX PAPER JAM` message appears on the printer control panel. The following table contains general questions you might ask and topics to explore before troubleshooting.

Table 39. General paper-path troubleshooting questions

Troubleshooting check	Action
What is the frequency of the jams (for example: continuous, one jam per 100 pages, one jam per 1000 pages)?	Verify with the customer. Print the event log to determine the jam history. See figure 94, “Sample event log,” on page 191. to evaluate the event log.
Do jams only occur when the print media is fed from a particular paper input source (such as tray 1 or tray 2)?	Use the paper path test to isolate the problem. See “Paper-path test” on page 222.
Do jams only occur when print media is output to a specific output bin (either the top output bin or rear output bin)?	Use the paper-path test to isolate the problem. See “Paper-path test” on page 222.
Do jams occur with a specific type of paper?	Try different media. See the *HP LaserJet Printer Family Print Media Guide*. The guide is bundled with this service manual.
Where does the leading edge of the first sheet of paper in the printer paper path stop when a jam occurs? Are any sheets of media damaged or torn?	Attempt to duplicate. Use the paper-path test to isolate the problem. Inspect the paper path and all paper-path mechanical assemblies up to the location where the jams occur.
Is the customer loading the paper trays correctly?	Observe the customer loading print media. Do not fan paper. See proper media handling procedures in the *HP LaserJet Printer Family Print Media Guide*.
Is the customer overfilling the paper trays?	Ensure that print media is not over the maximum fill marks in the paper trays. Heavy media, such as transparencies, labels, and card stock, might feed better if only a few sheets are loaded at a time. Observe the customer loading paper in the trays.

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Table 39. General paper-path troubleshooting questions (continued)

Troubleshooting check	Action
Are the paper tray guides set correctly?	For tray 1, ensure the guides are adjusted correctly with the sides of the media. Make sure the media fits under the tabs on the guides and not above the load-level indicators. For trays 2, 3, and 4: 1. Squeeze the lever on the left guide and slide the guides into place to match the width of the paper. 2. Squeeze the lever on the rear paper guide and slide it to the desired size until it clicks into place. 3. To make the third adjustment, squeeze the blue tab located on the right side of the tray and move it to the correct position based on the media size required. 4. Make sure the print media is flat in the tray at all four corners and below the front and back tabs.
Does the printer need to be cleaned?	Inspect the paper path and paper path rollers. See the cleaning procedures in chapter 4.
When was maintenance last performed on the printer?	Determine from the configuration page the number of pages since the last maintenance. (See “Maintenance interval” on page 77.) The printer maintenance kit should be installed every 200,000 images.

There are five photosensors (PS102, PS103, PS106, PS107, and PS108) in the paper path for detecting arrival or passing of the paper. Additional sensors are located in the optional duplexer.

If the sheet does not reach or pass these sensors within the prescribed time, the microprocessor on the engine controller board assesses a jam. See page 263 for the location and function of sensors.

Paper-path test

To perform a paper-path test:

1. Press MENU until INFORMATION MENU appears.
2. Press ITEM until PRINT PAPER PATH TEST appears.
3. Press SELECT. INPUT=TRAY 1 is displayed
4. Press VALUE+ to cycle selections until the desired paper tray appears.
5. Press SELECT. OUTPUT=TOP BIN is displayed.
6. Press VALUE+ until the desired output bin appears (open the rear output bin to print to it).
7. Press SELECT. DUPLEX=ON is displayed. This selection only appears when a duplexer is installed.
8. Press VALUE+ until the desired duplex mode (ON or OFF) appears.
9. Press SELECT. COPIES=1 appears.
10. Press VALUE+ to cycle selections until the desired number of copies appears. Choose 1, 10, 50, 100, or 500 copies.
11. Press SELECT to perform the paper-path test.

Information pages

From the printer control panel you can print pages that give details about the printer and its current configuration. The following information pages are described here:

- Menu map
- Configuration page

For a complete list of the printer information pages, print a menu map and see the information menu.

Menu map

To see the current settings for the menus and items available on the control panel, print a control panel menu map:

1. Press MENU until INFORMATION MENU appears.
2. Press ITEM until PRINT MENU MAP appears.
3. Press SELECT to print the menu map.

The content of the menu map varies, depending on the options currently installed in the printer. The printer driver or software application can override many of these values.

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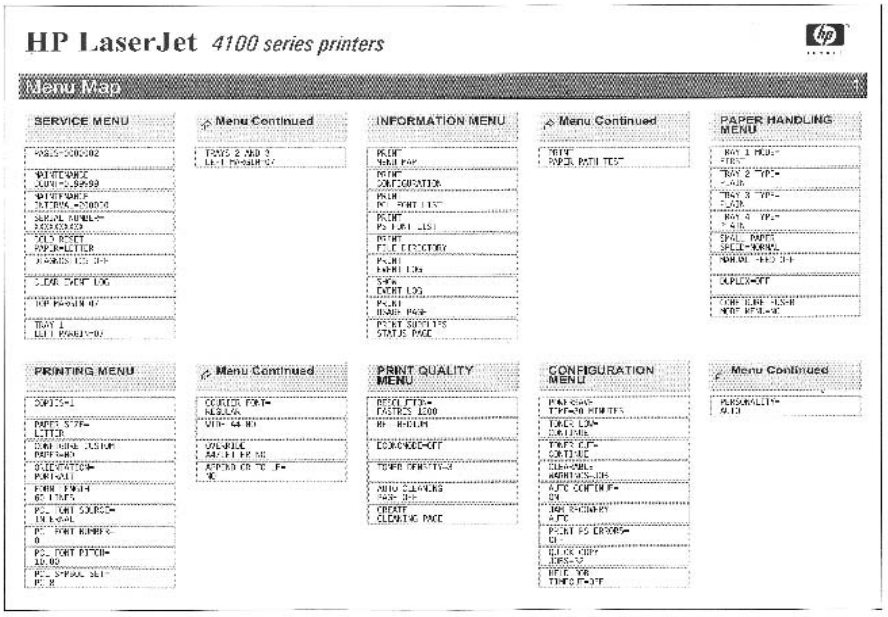

Figure 95. **Sample menu map (1 of 2)**

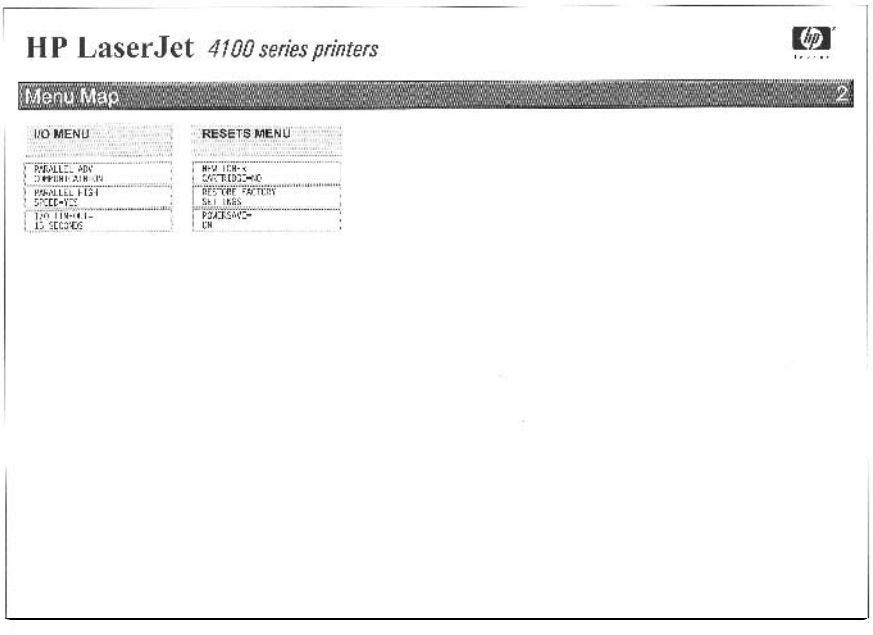

Figure 96. **Sample menu map (2 of 2)**

Embedded Web server

The embedded Web server allows you to view printer and network status and to manage printing functions from your computer instead of from the printer control panel. This service is designed for offices using an IP network and a standard Web browser. Below are examples of what you can do using the embedded Web server:

- View printer control panel messages.
- Determine the remaining life of all consumables.
- Order consumables.
- View and change tray configurations.
- View and change the printer control panel menu configuration.
- View and print internal pages.
- Receive notification of printer events.
- View and change network configuration.

To use the embedded Web server, you must have an IP-based network and a Web browser. The embedded Web server can be used with Microsoft® Internet Explorer 4 or above, and with Netscape™ Navigator 4 and above. IPX-based printer connections are not supported by the embedded Web server.

To use the embedded Web server

1 Open your Web browser.

2 Type the IP address assigned to the printer into the Address or Location field.

The IP address for the printer is listed on the printer configuration page. For more information about printing a configuration page, see page 226.

Embedded Web server page sets

The embedded Web server has three sets of internal Web pages for collecting information about the printer and for changing configuration options. These sets are:

- Home pages
- Device pages
- Networking pages

When the embedded Web server is active, each set of pages is listed on the browser screen. Click the set that you want to view, and the selection expands to display a list of frequently used Web links.

Note Each page in the embedded Web server connects to online Help. For more information regarding a particular page, click the Help button.

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Home page set

The home pages of the embedded Web server are the informational pages for the printer. These include:

- **Printer status page**

  This page displays printer capabilities, control panel messages, and status lights that currently appear on the printer control panel. From here, you can set the frequency at which the embedded Web server will check the printer status. This page also displays consumable life levels and the input tray configurations.

- **Configuration page**

  This page displays the printer configuration page. For more information about interpreting and printing the configuration page, see page 226.

- **Supplies status page**

  This page displays the levels of the consumables for the printer.

- **Usage page**

  This page displays the amount of each media type that has been used by the printer.

- **Event log page**

  This page displays the printer event log. For more information about displaying and printing the event log, page 192.

- **Device identification page**

  This page displays the name, asset number, network address, model number, and serial number for this printer.

- **Device page set**

  The device pages of the embedded Web server allow you to configure the printer from your computer. The device pages can be password protected. Always consult with your network administrator before changing the printer's configuration.

- **Configure printer page**

  Configure all printer settings from this page.

- **Alerts page**

  Input a list of recipients for electronic notification of various printer events.

- **E-mail page**

  Configure the incoming and outgoing mail servers.

- **Security page**

  Set a password for the embedded Web server. Passwords and features configuration should only be determined by the network administrator. If a password is set, users will require a password for entry into the device sections of the embedded Web server.

- **Other links page**

  Add or customize links to other websites. These links are displayed on the navigational bar throughout the embedded Web server pages.

  There are two permanent links: "Ask a question" where the user can get help with the printer, and "Order Supplies" where you can order printer supplies. "Order Supplies" is only available from the device page set.

- **Language page**

  Determine the language in which to display the embedded Web server information.

- **Device Identification page**

  Name the printer and assign an asset number to it. Input the name and e-mail address of the primary point of contact for information about the printer. This page also shows the printer's network names, addresses, and printer model information.

Configuration page

Use the configuration page to view current printer settings, to help troubleshoot printer problems, or to verify installation of optional accessories, such as memory (DIMMs), paper trays, and printer languages.

Note If an HP JetDirect print server EIO card is installed, a JetDirect configuration page will print out as well.

To print a configuration page:

1. Press MENU until `INFORMATION MENU` appears.
2. Press ITEM until `PRINT CONFIGURATION` appears.
3. Press SELECT to print the configuration page.

Figure 97 on page 227 is a sample configuration page. The content of the configuration page varies, depending on the options currently installed in the printer.

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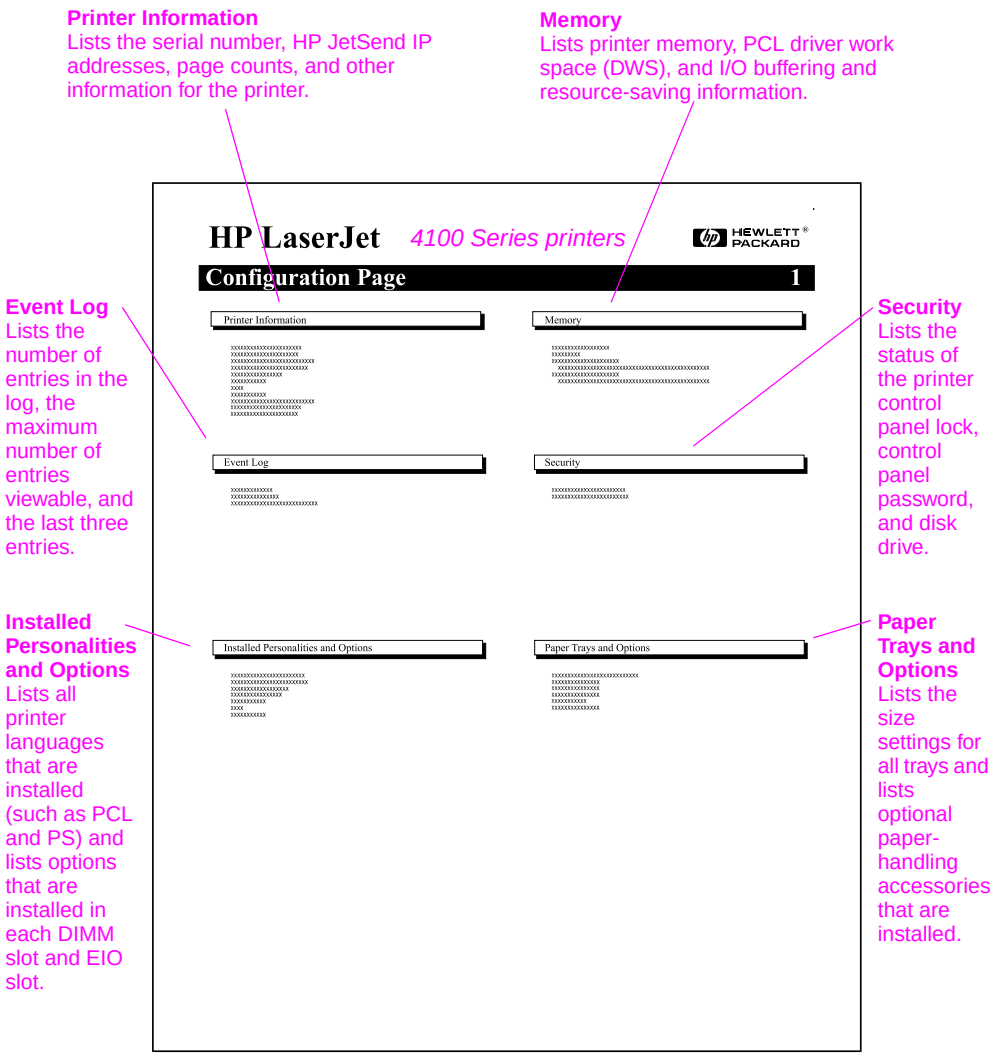
Printer Information
Lists the serial number, HP JetSend IP addresses, page counts, and other information for the printer.
Memory
Lists printer memory, PCL driver work space (DWS), and I/O buffering and resource-saving information.
HP LaserJet 4100 Series printers
HEWLETT PACKARD
Configuration Page 1
Printer Information
Memory
Event Log
Security
Installed Personalities and Options
Paper Trays and Options
Event Log
Lists the number of entries in the log, the maximum number of entries viewable, and the last three entries.
Security
Lists the status of the printer control panel lock, control panel password, and disk drive.
Installed Personalities and Options
Lists all printer languages that are installed (such as PCL and PS) and lists options that are installed in each DIMM slot and EIO slot.
Paper Trays and Options
Lists the size settings for all trays and lists optional paper-handling accessories that are installed.

Figure 97. **Sample configuration page (HP LaserJet 4100 series printer)**

Verify installed options

Under “Installed Personalities and Options” on the configuration page, look for options such as hard disk or DIMM types and sizes.

Verify that the options installed in the printer are reflected on the configuration page. If an installed device is not shown, reseat the device and print a new configuration page.

Image quality

When you are working with customers, obtain a print sample before you begin troubleshooting the printer. Ask the customer to explain the quality expected from the printer. The print sample will also help clarify the customer’s explanation.

Table 40. Image quality checks

Image quality checks	Action
Does the problem repeat on the page?	Use the repetitive defect ruler on page 243.
Is the toner cartridge full and is it manufactured by HP?	Check the toner cartridge using the checklist on page 228.
Is the customer using print media that meets all HP paper specification standards?	For more information about HP's paper specification standards, see chapter 1 of this manual and the *HP LaserJet Printer Family Print Media Guide*.
Is the print sample similar to those in the print-quality tables see page 1-22?	Compare and perform the actions recommended in the print-quality tables.
Is the problem on the toner cartridge drum or the transfer roller?	Perform the half self-test functional check (page 244) to determine where the defect is. If a dark and distinct toner image is preset on the drum's surface, assume that the first four functions of the electrophotographic process are functioning (cleaning, conditioning, writing, and developing–see chapter 5), and troubleshoot the failure as a transfer or fusing problem.

Check the toner cartridge

Image formation defects are often the result of problems with the toner cartridge. If there is any doubt, always replace the toner cartridge before troubleshooting image defects.

Use the following checklist to ensure that the toner cartridge is still operable.

- Ensure that the toner cartridge has toner. Weight is one indication of the presence of toner, as shown in table 41.

Table 41. Weights of toner cartridges

Toner Cartridge Capacity	Full Weight	Typical Empty Weight[1]
6,000 pages	1343 grams (47.4 ounces)	1105 grams (39 ounces)
10,000 pages	1490 grams (52.59 ounces)	1110 grams (39.18 ounces)

1. Depending on the exact pages printed, the toner cartridge might be empty and weigh more than these values.

- Check the expiration date of the toner cartridge (stamped on the box).
- Check the toner cartridge to see if it has been disassembled or refilled.
- Ensure that the toner cartridge is seated properly in the printer.
- Inspect the cartridge for toner leaking through worn seals. (If the drum has been manually rotated, the rotation might have caused internal damage and toner might spill.)

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Note Toner cartridges are rated for 6,000 or 10,000 images at 5 percent coverage (depending on the model). It is possible to wear out the gears and the cartridge seals before TONER LOW appears if the number of images exceeds 6,000 or 10,000 (depending on the model). See “EconoMode” below. A depleted cartridge will often create print defects.

- Check the surface of the photosensitive drum in the cartridge to see if it has been damaged or scratched. Touching the drum will contaminate the photosensitive surface and can cause spotting and defects during printing.
- White areas on the page might indicate that the drum has been exposed to light for too long. If white areas appear, stop the printer and wait a few minutes. This should eliminate most defective images. If not, place the toner cartridge in a dark environment for several days. This can restore some life to the drum.

EconoMode

EconoMode creates draft-quality printing by reducing the amount of toner on the printed page by up to 50 percent. Advise the customer to turn EconoMode on or off from the printer driver or software application, because those settings override the control panel settings. EconoMode settings can also be changed from the print quality menu.

CAUTION HP does not recommend full-time use of EconoMode. If EconoMode is used frequently, it is possible that the toner supply will outlast the mechanical parts in the toner cartridge.

Image defects

The quality of the printer output is subject to the judgment of the user. This section of the manual helps you define print quality defects and understand what factors affect print quality.

The print samples shown in the following tables illustrate some print quality defects. For future reference, retain copies of print quality defects encountered in the field with an explanation of their causes.

The image defects listed below are covered in the following tables.

- Black page (page 231)
- Blank spots (page 233)
- Creases (page 233)
- Curl (page 234)
- Contamination on back (page 234)
- Distorted image (page 235)
- Dropouts (page 235)
- Faded print/bubbles (page 235)
- Gray background (page 236)
- Horizontal black lines (page 236)
- Horizontal smudges (page 237)
- Horizontal white lines (page 237)
- Light print, dark print, or fade (page 238)
- Loose toner (page 239)
- Repetitive defects (page 239)
- Skew (page 239)
- Toner smear (page 240)
- Toner specks (page 240)
- Vertical black lines (page 241)
- Vertical dots (page 241)
- Vertical white lines (page 241)
- Repeating image (page 242)
- Misformed characters (page 242)
- Tire tracks (page 242)
- White spots on black (page 243)

Hint If you find a defect that is not depicted, record the probable cause along with the conditions in the printing environment and save a copy of the defect for future reference.

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Table 42. Image defects

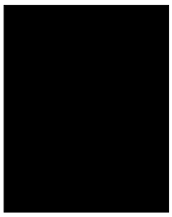
Problem	Cause	Solution
Black page 	The high-voltage power supply connections are contaminated.	Clean the high-voltage power supply terminals. (See “Engine controller board layout,” figure 105 on page 254.) Also clean the high-voltage springs where they contact the toner cartridge.
	The high-voltage power supply is installed improperly. If the high-voltage power supply has been removed and replaced, it might not be seated properly.	Remove the engine controller board and check the connectors for damage. Reseat the engine controller board, being certain to fully seat the connectors.
	Defective primary charging roller.	Replace the toner cartridge.
	The laser drive circuitry is damaged on the engine controller board so that the laser is always on.	Replace the laser scanner assembly and engine controller board, followed by the formatter, if necessary.

Table 42. Image defects

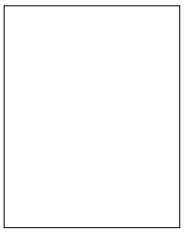
Problem	Cause	Solution
White page 	No toner is available for print.	Remove sealing tape or replace the toner cartridge.
	Defective laser shutter.	Check the laser shutter for free operation when inserting the toner cartridge.
	Toner cartridge guide damaged, improperly positioned, or missing.	Make sure the guide is installed properly above the toner cartridge.
	No transfer roller voltage.	Without transfer roller voltage, toner cannot be attracted from the surface of the drum to the print media. Perform the half self-test functional check (page 244) to check all other electrophotographic processes. Replace the transfer roller if necessary.
	No developing bias.	1. Clean the high-voltage power supply contacts. With no developing bias charge, toner is not attracted to the drum. 2. Replace the engine controller board.
	No drum ground path.	With no ground path, the drum cannot discharge. The negative charge on the drum repels toner, and leaves a white page with bubble print. 1. Check the drum ground spring and reconnect it, if necessary. 2. Replace the engine controller board.
	Defective laser scanner cable assembly.	Low-level signals exchanged between the laser/scanner assembly and the engine controller board might be affecting laser output. Replace the laser/scanner cable assembly.

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Table 42. Image defects

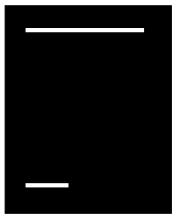
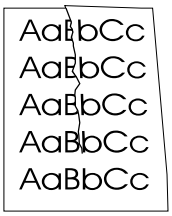
Problem	Cause	Solution
Blank spots 	Print media does not meet printer specifications or is stored improperly.	1. Print a few more pages to see if the problem corrects itself. 2. Turn over the stack of media in the tray. Also try rotating the media 180°. 3. If the print media does not meet HP specifications, replace the paper, and advise the customer to use the recommended print media and store it properly.
	Contaminated or deformed transfer roller.	Replace the transfer roller.
	Defective toner cartridge.	Replace the toner cartridge.
		See also “Dropouts” on page 235.
Creases 	Print media does not meet printer specifications or is stored improperly.	1. Print a few more pages to see if the problem corrects itself. 2. Turn over the stack of media in the tray. Also try rotating the media 180°. 3. If the print media does not meet HP specifications, replace the paper, and advise the customer to use the recommended print media and store it properly.
	Printer’s operating environment does not meet specifications.	Make sure the printer’s operating environment meets specifications.
	Print media is loaded incorrectly.	Make sure print media is loaded correctly and that the guides fit properly against the media stack.
	Wrong tray.	Print from a different tray (such as tray 1).
	Wrong output bin for print media type.	Print to a different output bin (top or rear output bin).
	Obstruction in paper path.	1. Check the paper path for print media debris. 2. Check for damaged components that could be creasing the media.

Table 42. Image defects

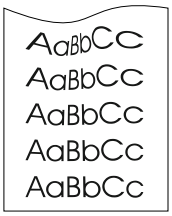
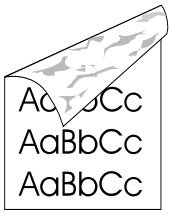
Problem	Cause	Solution
Curl 	Print media does not meet printer specifications or is stored improperly.	1. Print a few more pages to see if the problem corrects itself. 2. Turn over the stack of media in the tray. Also try rotating the media 180°. 3. If the print media does not meet HP specifications, replace the paper, and advise the customer to use the recommended print media and store it properly.
	Printer's operating environment does not meet specifications.	Make sure the printer's operating environment meets specifications.
	Wrong output bin.	Print to a different output bin (top or rear output bin).
	Wrong fuser setting for print media type.	From the paper-handling menu on the control panel, change the fuser mode setting or choose another paper type from the printer driver.
		See also "Dropouts" on page 235.
Contamination on back 	Contamination inside printer (tray separation roller, feed roller, transfer roller, fuser, toner cartridge).	1. Print at least 10 pages to see if the problem goes away. 2. Print a cleaning page (page 84). Identify and clean the contaminated part according to the repetitive defect ruler on page 243. If contamination cannot be removed, replace the contaminated part. 3. Check for toner leaks.
	Print media does not meet printer specifications or is stored improperly.	1. Print a few more pages to see if the problem corrects itself. 2. Turn over the stack of media in the tray. Also try rotating the media 180°. 3. If the print media does not meet HP specifications, replace the paper, and advise the customer to use the recommended print media and store it properly.

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Table 42. Image defects

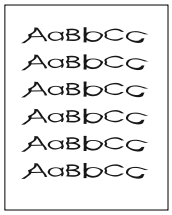
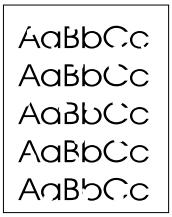
Problem	Cause	Solution
Distorted image 	Print media does not meet printer specifications or is stored improperly.	1. Print a few more pages to see if the problem corrects itself. 2. Turn over the stack of media in the tray. Also try rotating the media 180°. 3. If the print media does not meet HP specifications, replace the paper, and advise the customer to use the recommended print media and store it properly.
	Printer's operating environment does not meet specifications.	Make sure the printer's operating environment meets specifications.
	Wrong output bin for print media type.	Print to a different output bin.
	Poor connection of cables to the laser scanner.	Reseat the cables connected to the laser/scanner.
	Poor connection of cables to the engine controller board.	Reseat the cables connected to the engine controller board.
	Defective laser scanner.	Replace the laser scanner.
	Defective engine controller board.	Replace the engine controller board.
Dropouts 	Paper might be too smooth.	Check the paper (or other print media) type and quality.
	Printer's operating environment does not meet specifications.	Make sure the printer's operating environment meets specifications.
	Wrong toner density setting.	From the print-quality menu on the control panel, adjust the toner density setting. Make sure EconoMode is off.
	Wrong fuser setting for paper type.	From the paper-handling menu on the control panel, change the fuser mode setting to High1 or High2 or choose another paper type from the printer driver.
		See also "Blank Spots" on page 233.

Table 42. Image defects

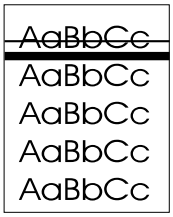
Problem	Cause	Solution
Faded print/ bubbles	No drum ground path.	With no ground path, the drum cannot discharge. The negative charge on the drum repels toner and leaves a white page with bubble print. 1. Check the drum ground spring and reconnect it, if necessary. 2. Replace the engine controller board.
	Engine controller board.	Replace the engine controller board.
Gray background	Print media does not meet printer specifications or is stored improperly.	1. Print a few more pages to see if the problem corrects itself. 2. Turn over the stack of media in the tray. Also try rotating the media 180°. 3. If the print media does not meet HP specifications, replace the paper, and advise the customer to use the recommended print media and store it properly
	Printer's operating environment does not meet specifications.	Make sure the printer's operating environment meets specifications.
	Wrong toner density setting.	From the print-quality menu on the control panel, adjust the toner density setting. Make sure EconoMode is off.
	Faulty toner cartridge.	Replace the toner cartridge.
		See also "Light print, dark print, or fade" on page 238.
Horizontal black lines 	Defective laser scanner assembly or engine controller board.	1. See the "Repetitive defect ruler" on page 243. 2. Reseat connectors on the laser scanner and engine controller board. 3. Replace the laser/scanner assembly followed by the engine controller board, if necessary.

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Table 42. Image defects

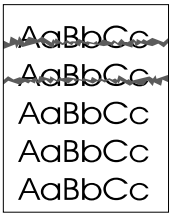
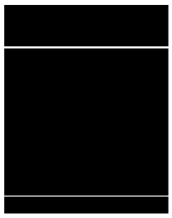
Problem	Cause	Solution
Horizontal smudges 	Paper-path contamination or damage.	1. See the “Repetitive defect ruler” on page 243. 2. Check the toner cartridge and replace it if necessary. 3. Check the fuser and replace it, if necessary.
Horizontal white lines 		1. Check the toner cartridge and replace it if necessary. 2. Check the fuser and replace it if necessary. 3. Replace the laser/scanner assembly, followed by the engine controller board, if necessary.

Table 42. Image defects

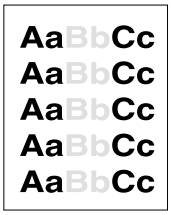
Problem	Cause	Solution
Light print, dark print, or fade  	Wrong toner density setting.	From the print-quality menu on the control panel, adjust the toner density setting. Make sure EconoMode is off.
	Toner cartridge is low.	Replace the toner cartridge.
	Transfer roller is defective.	Replace the transfer roller.
	Print media does not meet printer specifications or is stored improperly.	1. Print a few more pages to see if the problem corrects itself. 2. Turn over the stack of media in the tray. Also try rotating the media 180°. 3. If the print media does not meet HP specifications, replace the paper, and advise the customer to use the recommended print media and store it properly.
	Poor contact to the engine controller board.	1. Ensure that the drum ground spring is connected to the engine controller board correctly. 2. Clean the contacts if they are contaminated. If the problem remains after cleaning, or parts are damaged or deformed, replace them. 3. Replace the engine controller board, if necessary.
	Defective laser/scanner.	Replace the laser/scanner.
	Defective engine controller board.	Replace the engine controller board. See also “Faded Print/Bubbles” on page 236.

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Table 42. Image defects

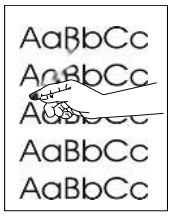
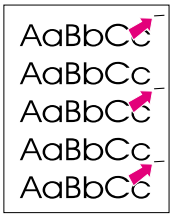
Problem	Cause	Solution
Loose toner 	Contamination in the printer.	1. Print a few more pages to see if the problem corrects itself. 2. Clean the inside of the printer or use the printer's cleaning page. (See "Cleaning the printer and accessories" starting on page 82.)
	Toner cartridge is defective.	Replace the toner cartridge.
	Paper might be too smooth.	Check the paper (or other print media) type and quality.
	Wrong fuser setting for paper type.	From the paper-handling menu on the control panel, change the fuser mode setting or choose another paper type from the printer driver.
	Defective fuser.	1. Maintenance might be due. Check this by printing a copy of the supplies status page. If maintenance is due, order and install the printer maintenance kit. 2. Replace the fuser.
Repetitive defects 	Contamination or defect on a roller.	See the "Repetitive defect ruler" on page 243.
Skew	Print media does not meet printer specifications or is stored improperly.	1. Print a few more pages to see if the problem corrects itself. 2. Verify that there are no torn pieces of media inside the printer. 3. Turn over the stack of media in the tray. Also try rotating the media 180°. 4. If the print media does not meet HP specifications, replace the paper, and advise the customer to use the recommended print media and store it properly.
	Print media is not loaded correctly or trays are not adjusted properly.	Make sure print media is loaded correctly and that the guides fit properly against the media stack.
	Registration assembly is improperly installed.	Be sure that the registration assembly is installed correctly.

Table 42. Image defects

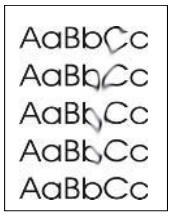
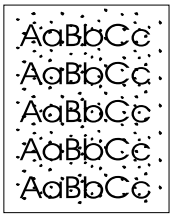
Problem	Cause	Solution
Toner smear 	Contamination in the printer.	1. Print a few more pages to see if the problem corrects itself. 2. Clean the inside of the printer or use the printer's cleaning page. (See "Cleaning the printer and accessories" starting on page 82.)
	Paper might be too smooth.	Check the paper (or other print media) type and quality.
	Defective toner cartridge.	Replace the toner cartridge. (See instructions with the toner cartridge.)
	Wrong fuser setting for paper type.	From the paper-handling menu on the control panel, change the fuser mode setting or choose another paper type from the printer driver.
Toner specks 	Contamination in printer.	1. Print a few more pages to see if the problem corrects itself. 2. Clean the inside of the printer or use the printer's cleaning page. (See "Cleaning the printer and accessories" starting on page 82.) 3. Activate the automatic cleaning page in the print-quality menu.
	Print media does not meet printer specifications or is stored improperly.	1. Print a few more pages to see if the problem corrects itself. 2. Turn over the stack of media in the tray. Also try rotating the media 180°. 3. If the print media does not meet HP specifications, replace the paper, and advise the customer to use the recommended print media and store it properly.
	Use of alternating small and standard print media (such as envelopes and letterhead).	To alternate small and standard paper, from the configuration menu on the control panel, set SMALL PAPER SPEED=SLOW.

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Table 42. Image defects

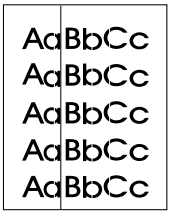
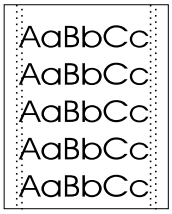
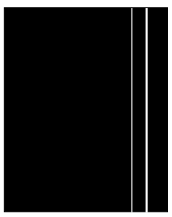
Problem	Cause	Solution
Vertical black lines 	Defective toner cartridge.	Replace the toner cartridge.
	Contaminated fuser entrance guide.	Clean the guide.
	Scratches on the fuser.	Replace the fuser.
	Worn fuser film.	1. Set the fuser to a lower temperature mode. 2. Replace the fuser. **Note** To prevent the print-quality problem, reduce printing on large volumes of narrow media, such as envelopes. Instead, alternate smaller volumes of narrow media with full-page printing jobs.
Vertical dots 	Contaminated static eliminator teeth.	Clean the static eliminator.
	Poor contact between the static eliminator and the engine controller board.	Clean the contacts, if contaminated. If the problem remains after cleaning, or parts are damaged or deformed, replace them.
	Deformed or deteriorated transfer roller.	Replace the transfer roller.
	Defective engine controller board.	Replace the engine controller board.
Vertical white lines 	Lack of toner or faulty toner cartridge.	Redistribute the toner in the toner cartridge. If the problem continues, replace the toner cartridge.
	Contamination in the laser path.	1. Clean the laser path. (Remove the laser/scanner assembly and clean the lens.) 2. Replace the laser/scanner assembly.
	Defective fuser.	Replace the fuser assembly.

Table 42. Image defects

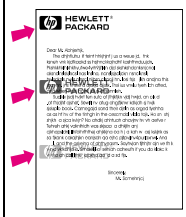
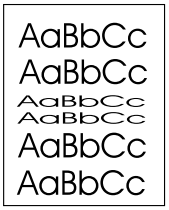
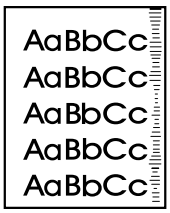
Problem	Cause	Solution
Repeating image 	This type of defect might occur when using preprinted forms, a large quantity of narrow media, or a fuser mode that is set too high for your media.	1. Print a few more pages and see if the problem corrects itself. 2. Make sure that print media type and quality meet HP specifications. 3. If you observe that this type of defect occurs on wide paper (such as letter or A4-size paper) just after printing on narrow media (such as envelopes), you can set SMALL PAPER SPEED on the paper-handling menu to SLOW. Note that this will slow down printing. 4. Check your fuser mode.
	Maintenance due	Print a copy of the supplies status page. If maintenance is due, order and install the printer maintenance kit.
Misformed characters 	Printer's operating environment does not meet specifications.	1. Print a few more pages to see if the problem corrects itself. 2. Make sure that the environmental specifications for the printer are being met.
	Maintenance due	Print a copy of the supplies status page. If maintenance is due, order and install the printer maintenance kit.
Tire tracks 	Toner cartridge is worn out.	1. Replace the toner cartridge after 6,000 or 10,000 pages, depending on the type of toner cartridge that is installed in the printer. 2. Reduce the number of pages that you print with very low toner coverage. 3. Use the 6,000-page cartridge if you cannot reduce the number of pages that have very little toner coverage.

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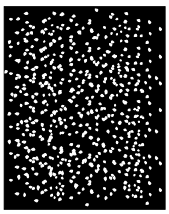
Table 42. Image defects

Problem	Cause	Solution
White spots on black 		1. Print a few more pages to see if the problem corrects itself. 2. Make sure that print media type and quality meet HP specifications. 3. Make sure that the environmental specifications for the printer are being met. 4. Replace the toner cartridge.

Repetitive defect ruler

Repetitive print defects are usually associated with a specific roller within the printer or the toner cartridge. Use figure 98 to isolate the cause of repetitive print defects. Align the first occurrence of the defect with the top of the “ruler” and measure to the next occurrence of the defect to determine the roller in question. When you are certain that your defect pattern matches the pattern of the ruler, replace the indicated roller.

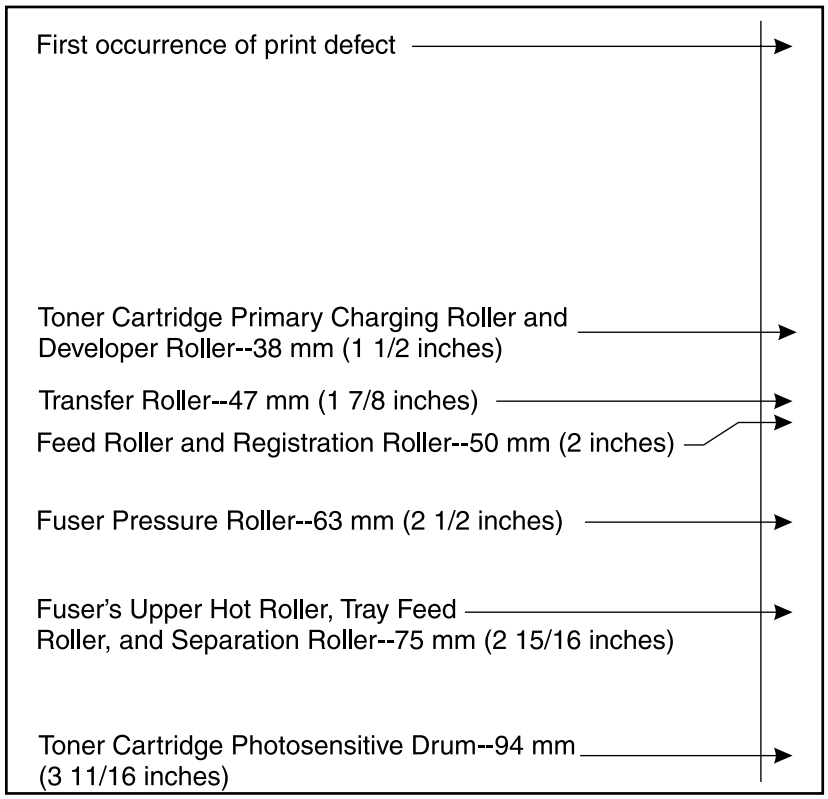

First occurrence of print defect
Toner Cartridge Primary Charging Roller and Developer Roller--38 mm (1 1/2 inches)
Transfer Roller--47 mm (1 7/8 inches)
Feed Roller and Registration Roller--50 mm (2 inches)
Fuser Pressure Roller--63 mm (2 1/2 inches)
Fuser’s Upper Hot Roller, Tray Feed Roller, and Separation Roller--75 mm (2 15/16 inches)
Toner Cartridge Photosensitive Drum--94 mm (3 11/16 inches)

Figure 98. **Repetitive print defect ruler**

Image system troubleshooting

Half self-test functional check

The electrophotographic process can be subdivided into the following stages:

- Cleaning (removes excess toner from drum surface)
- Conditioning (places a uniform electrical charge on drum)
- Writing (laser strikes surface of drum and creates latent image)
- Developing (forms the toner image on drum)
- Transferring (charge transfers the image to print media)
- Fusing (heat and pressure produces a permanent image)

The purpose of the half self-test check is to determine which stage is malfunctioning. Perform the test as follows:

1. Print a configuration page from the control panel information menu.
2. Open the top cover after the paper advances halfway through the printer (about three seconds after the main motor begins rotation). The leading edge of the paper should have advanced past the toner cartridge.
3. Remove the toner cartridge.
4. Open the toner cartridge drum shield to view the drum surface.

If a dark and distinct toner image is present on the drum's surface, assume that the first four functions of the electrophotographic process are functioning (cleaning, conditioning, writing, and developing–see chapter 5), and troubleshoot the failure as a transfer or fusing problem.

If no image is present on the photosensitive drum, perform all the following functional checks.

Drum rotation functional check

The photosensitive drum, located in the toner cartridge, must rotate for the print process to work. The photosensitive drum receives its drive from the main drive assembly. To verify whether the drum is rotating:

1. Open the top cover.
2. Remove the toner cartridge.
3. Mark the cartridge's drive gear with a felt-tipped marker. Note the position of the mark.
4. Install the toner cartridge and close the top cover. The start-up sequence should rotate the drum enough to move the marked gear.
5. Open the printer and inspect the marked gear. Verify that the mark moved. If the gear did not move, inspect the main drive assembly to ensure that it is meshing with the toner cartridge gears. If the drive gears function and the drum does not move, replace the toner cartridge.

Note This test is especially important if refilled toner cartridges are in use.

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High-voltage power supply functional check

The high-voltage power supply assembly provides the necessary voltages for the printer's electrophotographic processes. The +24 B VDC supply is used to power the high-voltage power supply assembly. A summary of the major components of the high-voltage system is given in table.

Table 43. High voltage system checks

Checks	Action
Are the connectors for the primary charge roller, drum ground, developing bias, and toner level sensor damaged, corroded, contaminated, or missing?	1. Inspect and correct each item. 2. Check the toner cartridge. 3. Check all wire connections. 4. Replace the engine controller board if the connection cannot be repaired.
Are the high-voltage power supply connections contaminated, bent, or broken?	1. Clean the terminals with alcohol only. 2. Check all wire connections. 3. Replace the engine controller board if the connection cannot be repaired.
Is the internal toner cartridge damaged?	Replace the toner cartridge.

Locations of components

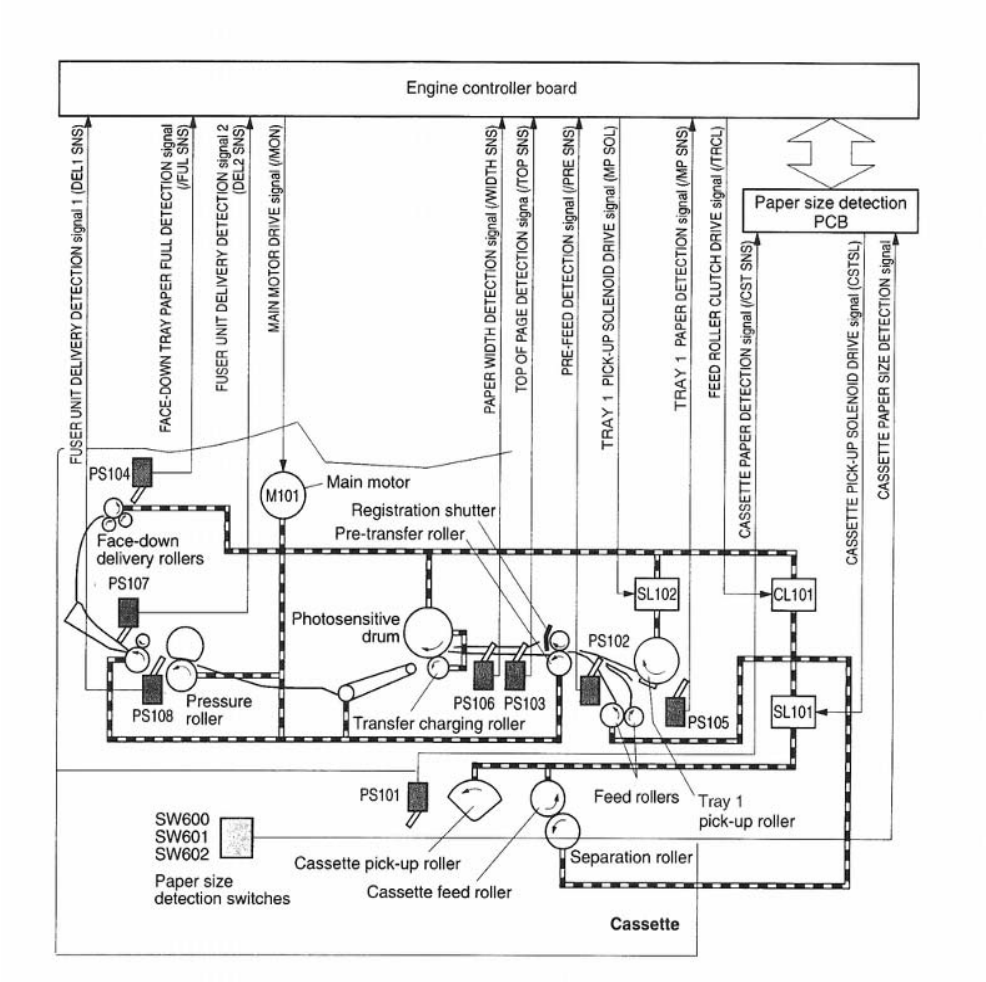

Figure 99. **Components of the paper pickup and feed system**

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Table 44. Components of the paper pickup and feed system

PS101	Tray 2 paper sensor
PS102	Prefeed sensor
PS103	Top-of-page sensor
PS104	Top output-bin-full sensor
PS105	Tray 1 paper sensor
PS106	Paper width sensor
PS107	Fuser delivery sensor 2
PS108	Fuser delivery sensor 1
SL101	Tray 2 pickup solenoid
SL102	Tray 1 pickup solenoid
CL101	Paper feed guide clutch
M101	Main motor

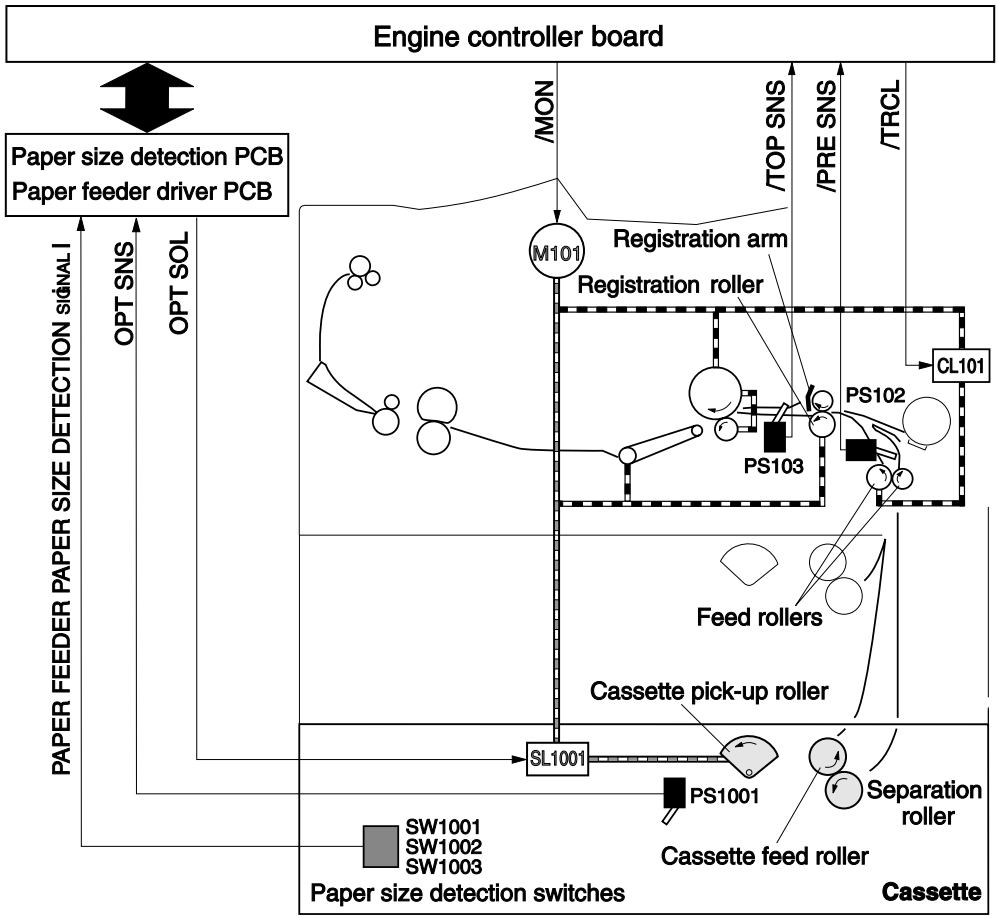

Figure 100. **Components of the optional paper feeder**

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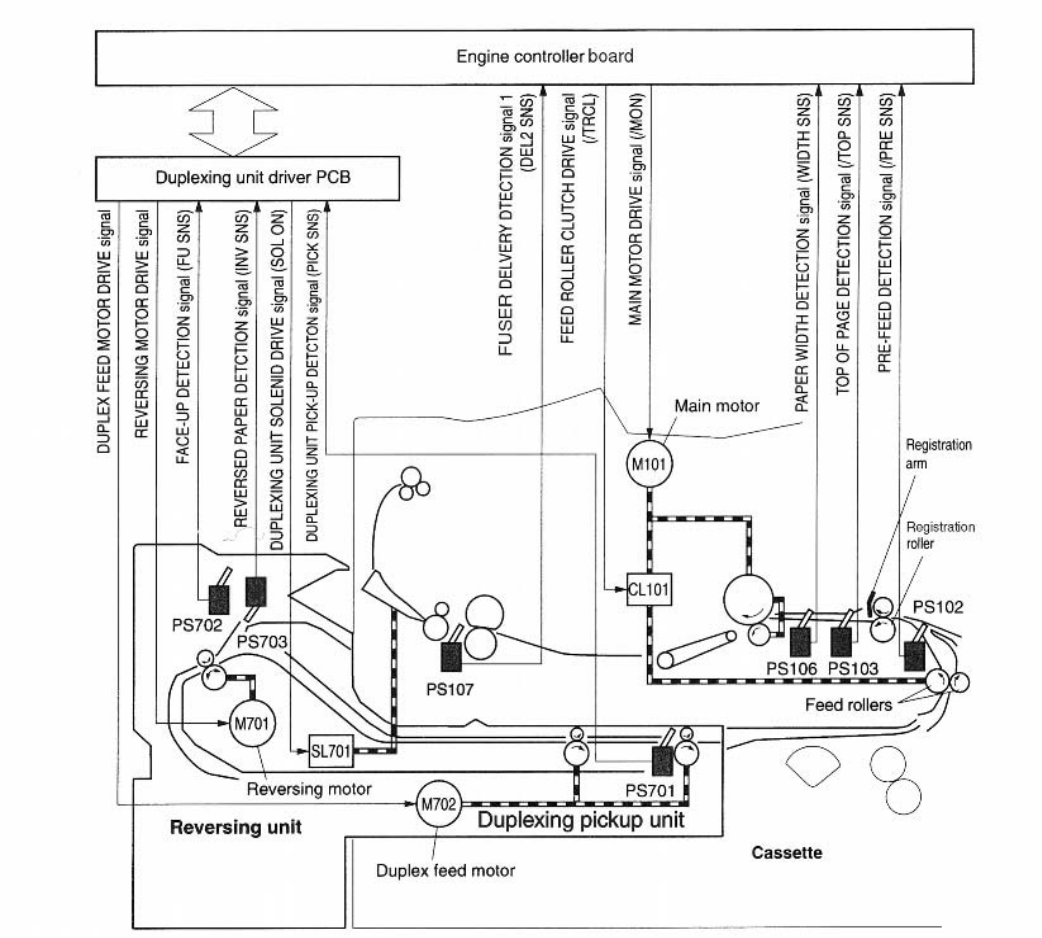

Figure 101. **Components of the optional duplexer**

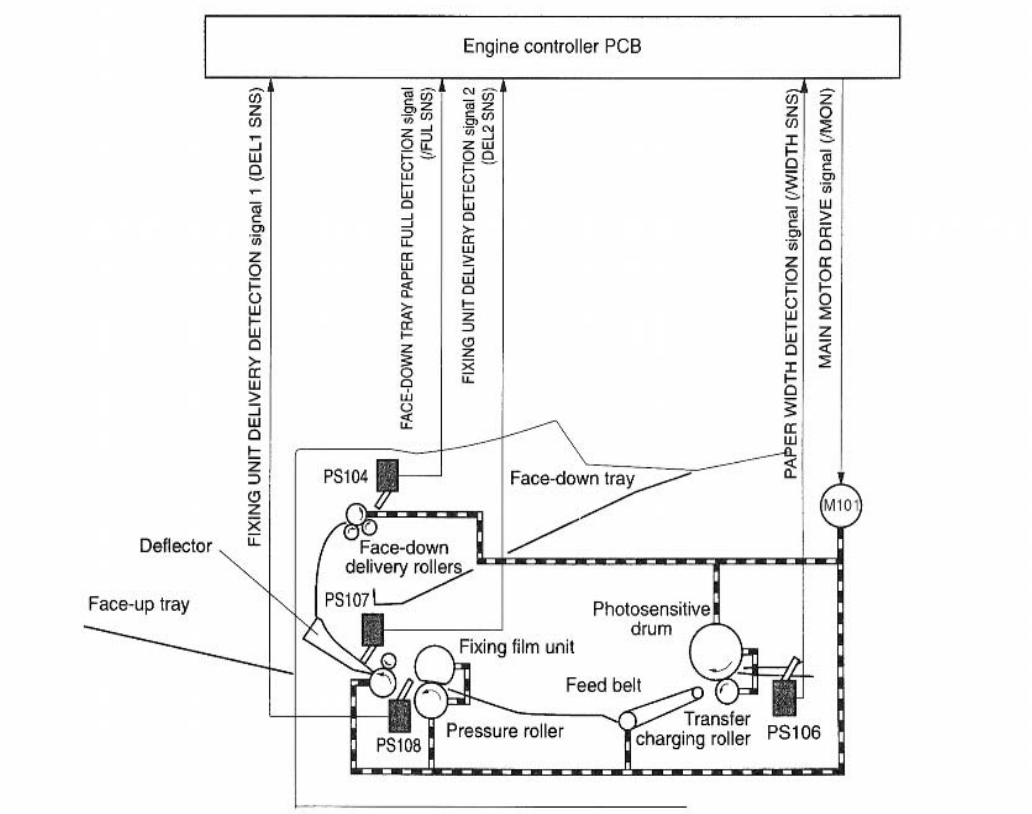

Figure 102. **Components of the fusing and delivery unit**

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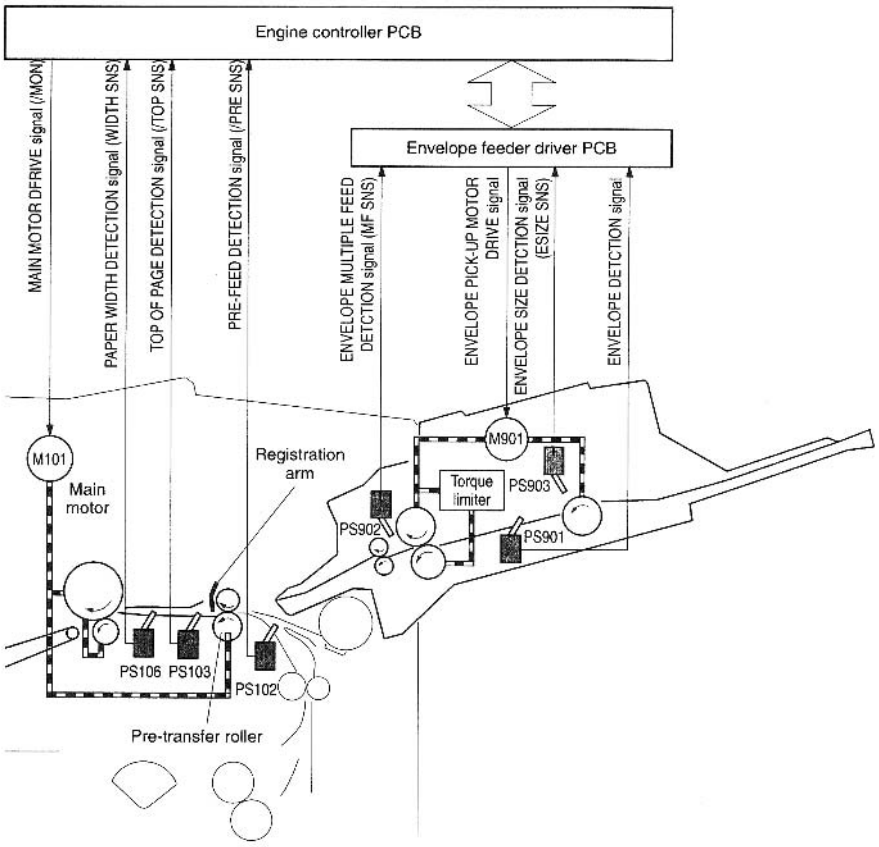

Figure 103. **Components of the optional envelope feeder**

Paper path

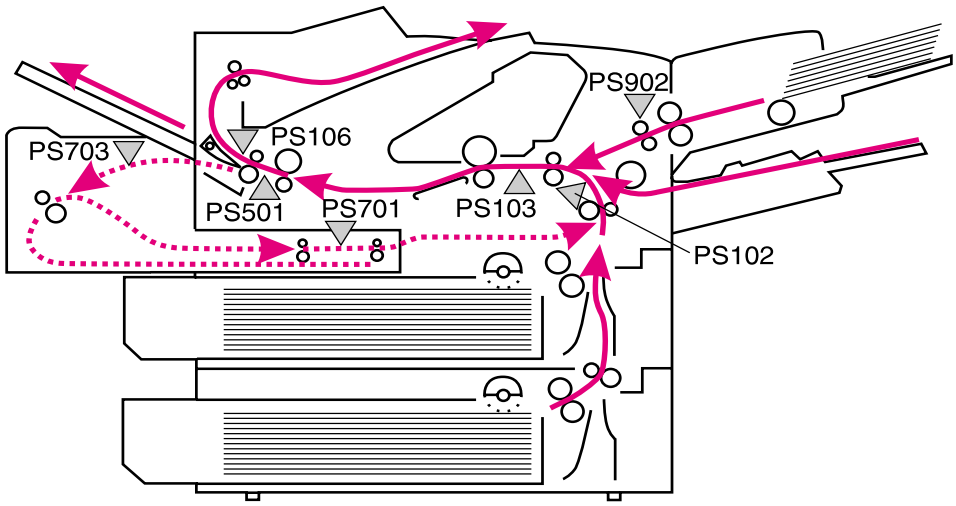

Figure 104. **Paper sensors and the paper path**

Table 45. Paper sensors

Sensor	Description	Sensor location
PS101	Tray 2 paper sensor	Sensor located on pickup drive assembly
PS102	Prefeed sensor	Sensor and flag located on registration/feed sensor assembly
PS103	Top-of-page sensor	Sensor and flag located on registration/feed sensor assembly
PS104	Top output bin full sensor	Sensor located on top output bin assembly
PS105	Tray 1 paper sensor	Sensor located on tray 1 assembly
PS106	Paper width sensor	Sensor located on the output assembly
PS107	Fuser paper-delivery sensor 2	Sensor and flag located on fuser assembly
PS108	Fuser paper-delivery sensor 1	Sensor located on engine controller flags on engine controller board and fusing assembly
PS701	Duplex pickup paper sensor (duplexer)	Sensor and flag located in duplexer

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Table 45. Paper sensors

PS703	Reversed-paper sensor (duplexer)	Sensor and flag located in duplexer
PS902	Envelope multiple feed sensor (envelope feeder)	Sensor and flag located in envelope feeder
PS1001	Optional 500-sheet paper feeder paper sensor	Sensor located on the 500-sheet tray
PS901	Envelope paper sensor	Sensor located on envelope feeder
PS903	Envelope width sensor	Sensor located on envelope feeder
PS702	Rear output bin open	Sensor located on the duplexer

Engine controller board

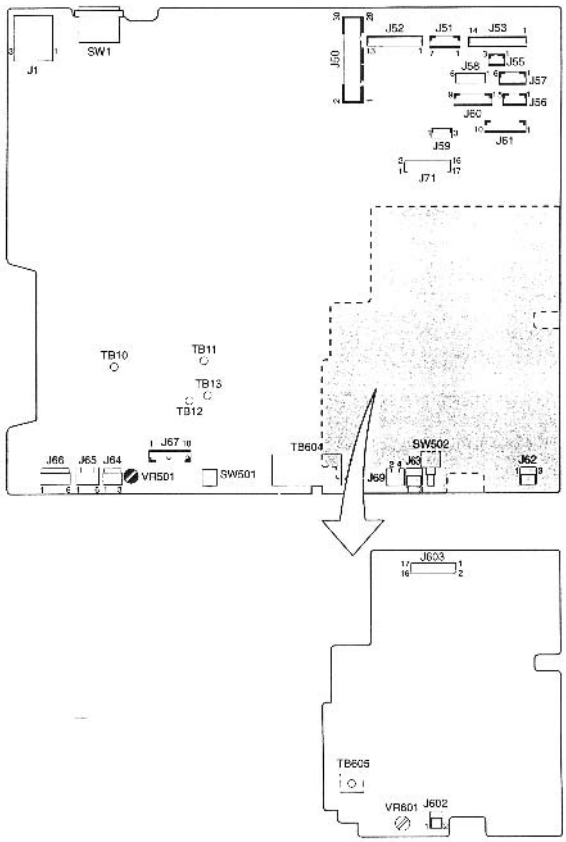

Figure 105. **Engine controller board layout**

Table 46. Engine controller board layout

SW1	Power switch
SW501	Test-print switch
SW502	Adjusted at factory
VR501	Top-of-page adjustment
VR601	Adjusted at factory

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Paper-size detection switches

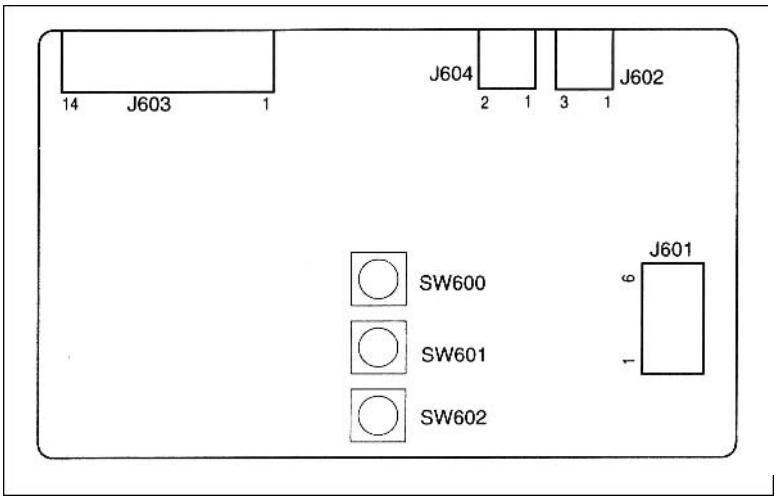

Figure 106. **Paper-size detection switches (1 of 2)**

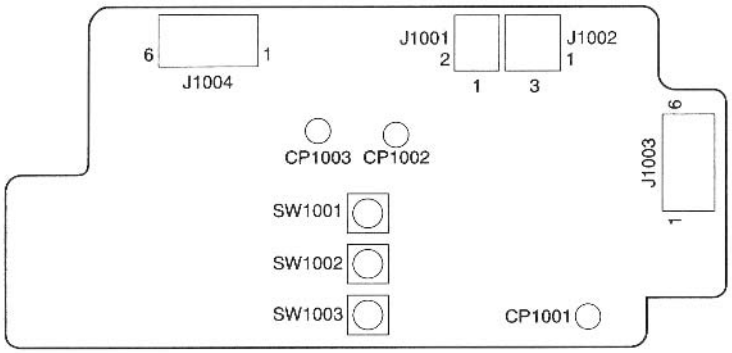

Figure 107. **Paper-size detection switches (2 of 2)**

Table 47. Paper-size detection switches

Paper size	Paper size detection switch		
	SW600/1001	**SW601/1002**	**SW602/1003**
No tray	OFF	OFF	OFF
Legal	OFF	OFF	ON
Executive	OFF	ON	OFF
Letter	OFF	ON	ON
Other	ON	OFF	OFF
Custom	ON	OFF	ON
B5	ON	ON	OFF
A4	ON	ON	ON

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Motors and fans

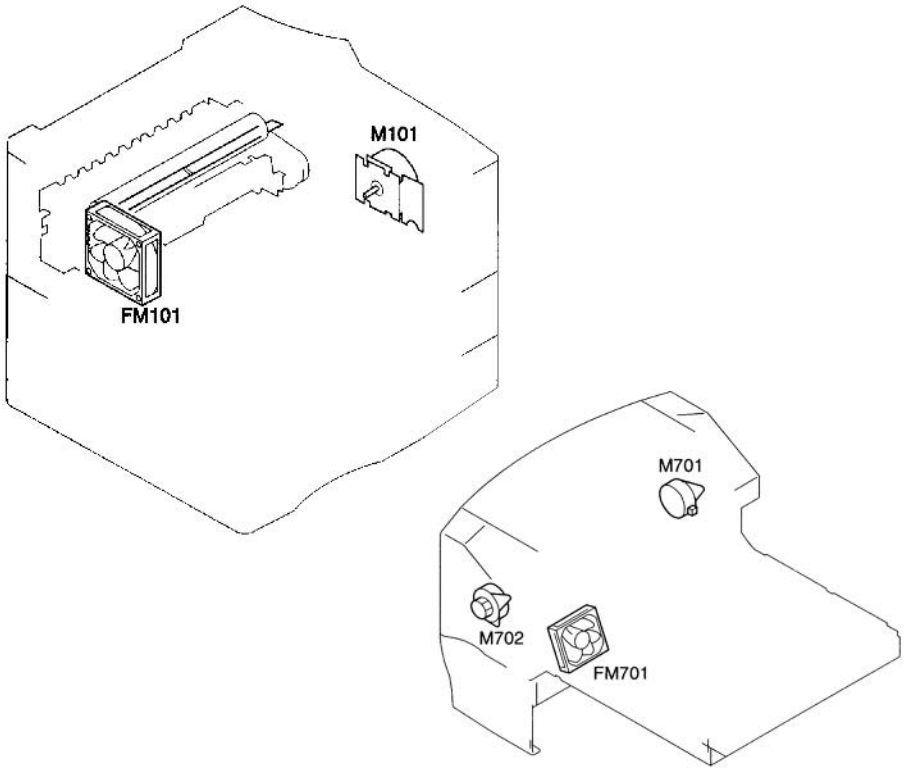

Figure 108. **Location of motors**

Table 48. Motors

M101	Main motor
M701	Reversing motor (duplexer)
M702	Duplex feed motor (duplexer)
M901	Envelope feeder motor
FM101	Cooling fan
FM701	Duplexer exhaust fan (duplexer)

Connectors

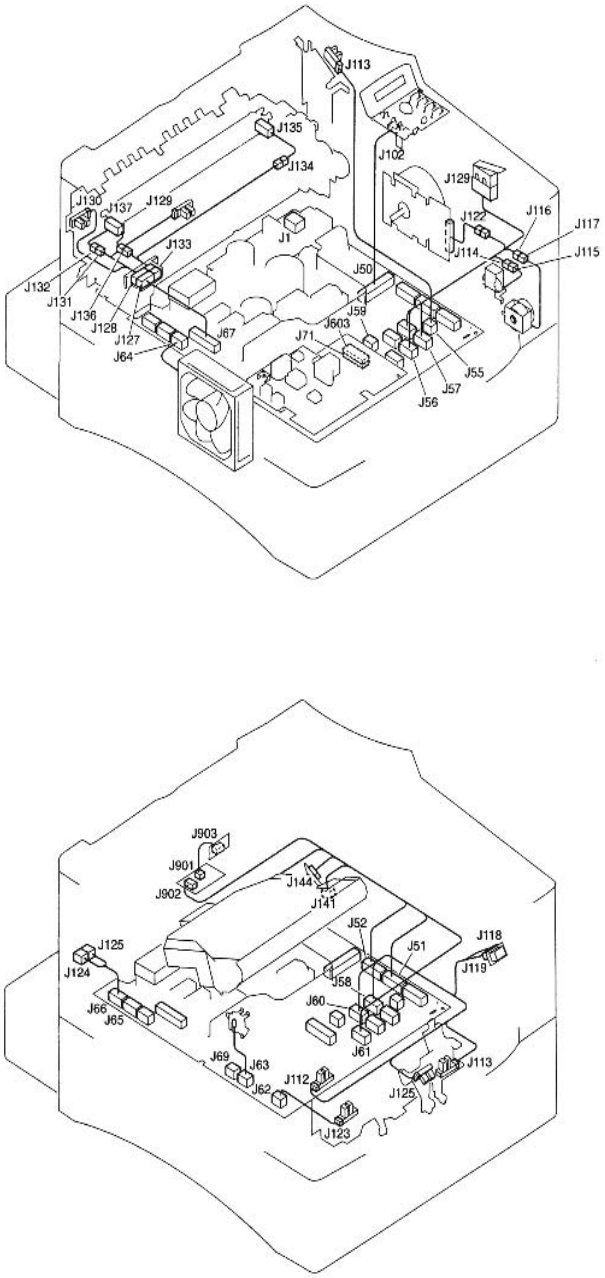

Figure 109. **Connectors (1 of 3)**

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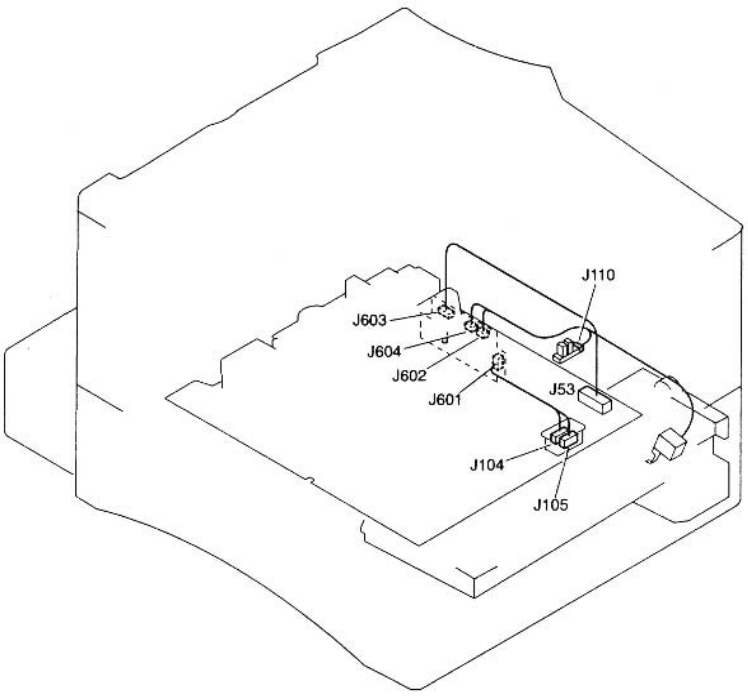

Figure 110. **Connectors (2 of 3)**

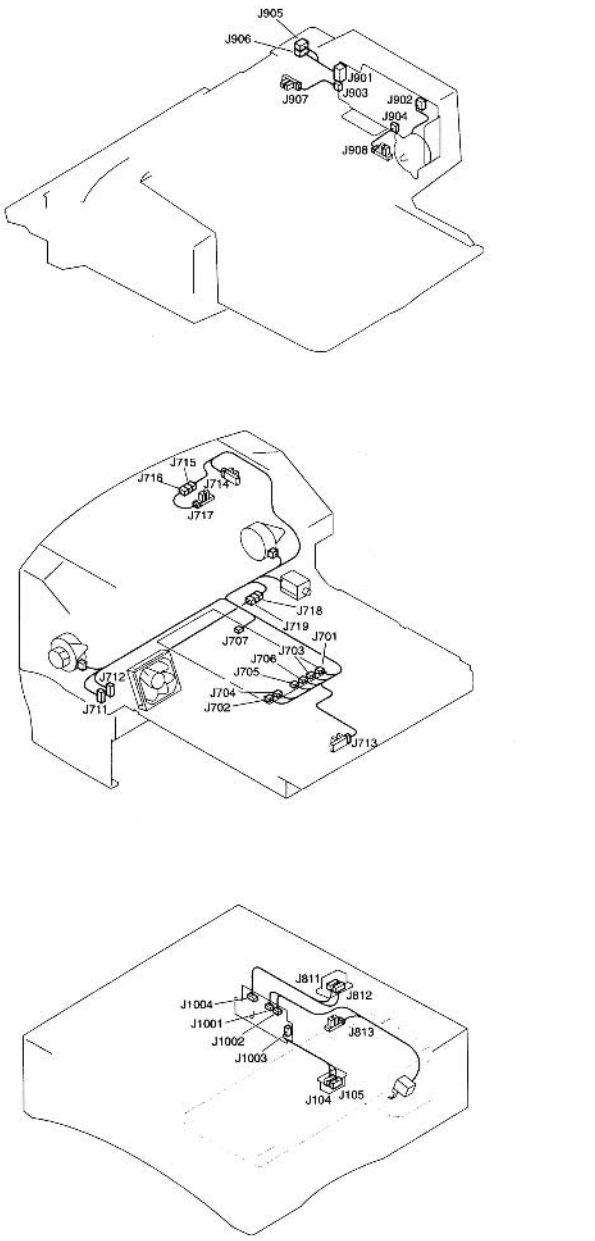

Figure 111. **Connectors (3 of 3)**

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PCAs

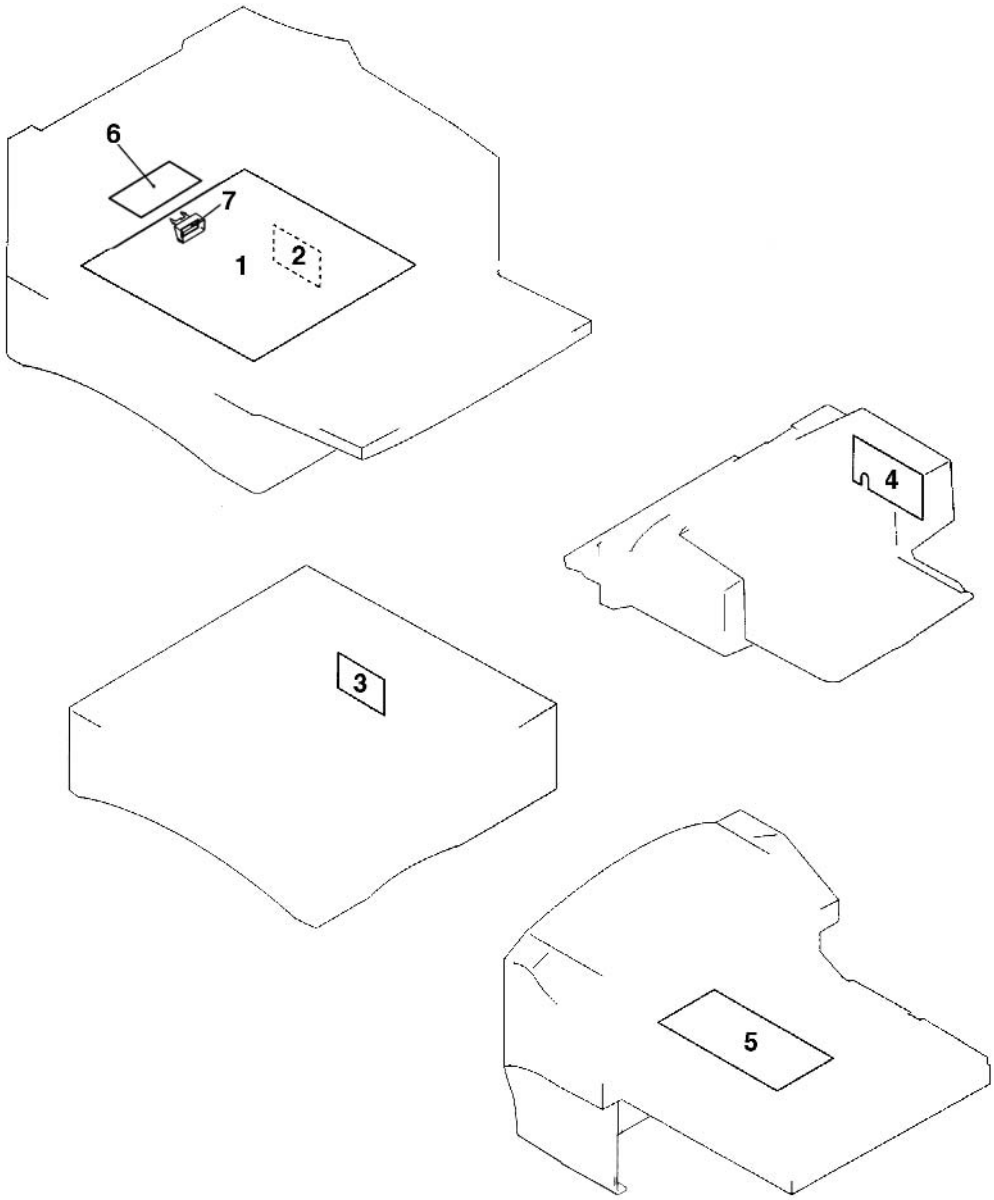

Figure 112. **Location of PCAs**

Table 49. Location of PCAs

1	Engine controller board	Sequence control, high-voltage output, DC output, and heater drive
2	Paper-size detection PCA (Tray 2)	Relay between sensors/solenoids and engine controller board, and paper size detection
3	Paper-feeder driver PCA (optional 500-sheet feeder)	Control and detection of solenoids in the optional 500-sheet paper feeder
4	Envelope-feeder driver PCA	Control and detection of solenoids in the envelope feeder
5	Duplexer driver PCA	Controls paper in the duplexer
6	Cartridge memory controller board	Receives read/write commands from the engine controller board for cartridge memory; sends error status messages to the engine controller board if an error occurs during the read/write process
7	Antenna PCB	Relay between the memory controller board and the engine controller board; permits read/write of the cartridge memory

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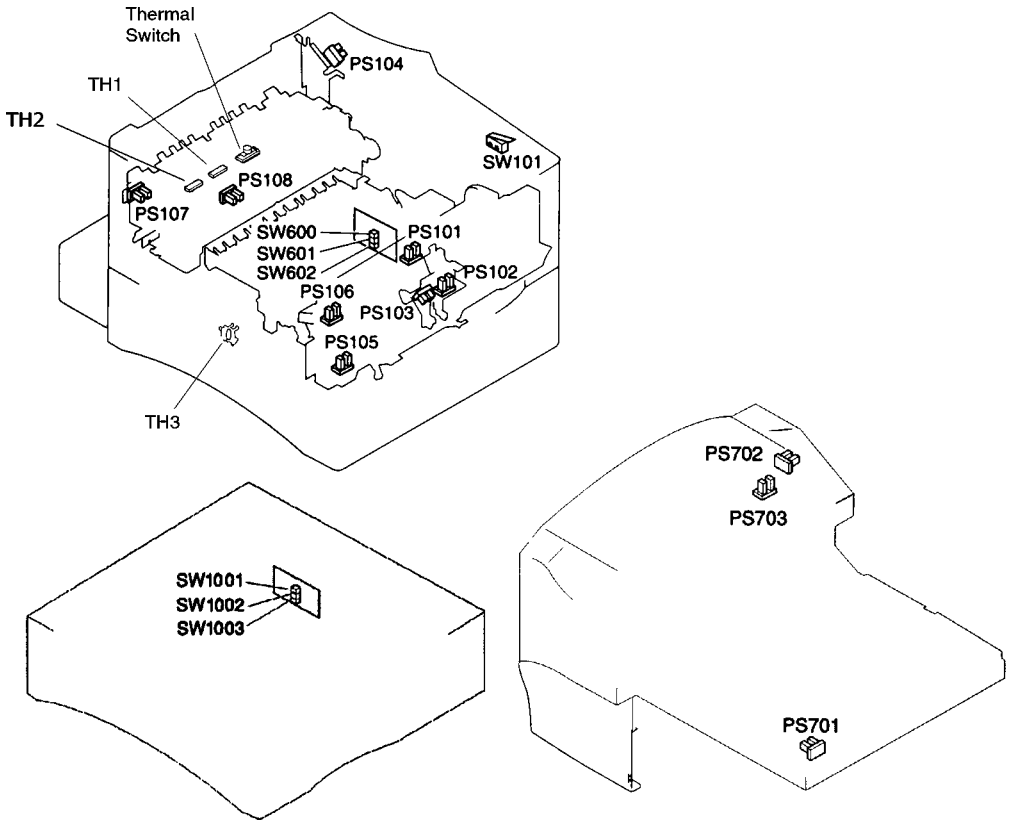

Figure 113. **Location of sensors, switches, and thermistors (1 of 2)**

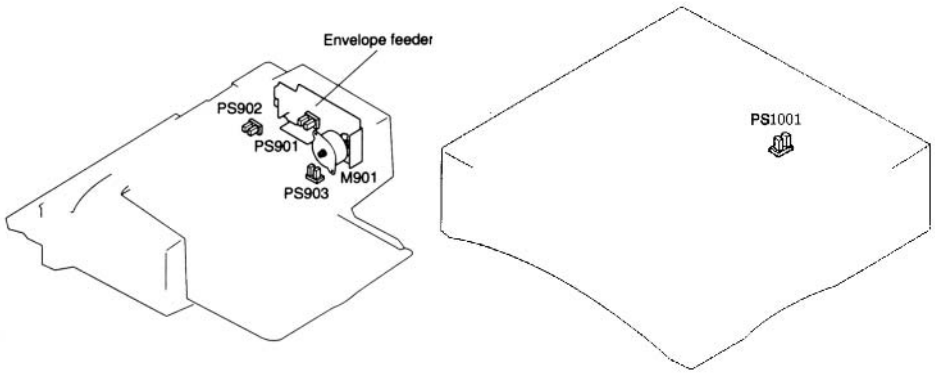

Figure 114. **Location of sensors, switches, and thermistor (2 of 2)**

Table 50. Sensors, switches, and thermistors

PS101	Tray 2 paper-out sensor
PS102	Prefeed sensor
PS103	Top-of-page sensor
PS104	Top output-bin-full sensor
PS105	Tray 1 paper-out sensor
PS106	Paper width sensor
PS107	Fuser paper delivery sensor 2
PS108	Fuser paper-delivery sensor 1
PS701	Duplex pickup paper sensor (duplexer)
PS702	Face-up sensor (duplexer)
PS703	Reversed-paper sensor (duplexer)
PS801	Paper feeder paper sensor (paper feeder)
PS901	Envelope sensor (envelope feeder)
PS902	Envelope multiple-feed sensor (envelope feeder)
PS903	Envelope width sensor (envelope feeder)
PS1001	Optional 500-sheet paper feeder paper-out sensor
SW1	Power switch (engine controller board)

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Table 50. Sensors, switches, and thermistors

SW101	Door-open detection switch
SW501	Test print switch (engine controller board)
SW600	Tray 2 paper-size switch (paper size detection PCB)
SW601	Tray 2 paper-size switch (paper size detection PCB)
SW602	Tray 2 paper-size switch (paper size detection PCB)
SW1001	Optional 500-sheet paper feeder paper-size switch
SW1002	Optional 500-sheet paper feeder paper-size switch
SW1003	Optional 500-sheet paper feeder paper-size switch
TH1	Fuser heater detection thermistor 1
TH2	Fuser heater detection thermistor 2
TH3	Environment temperature detection thermistor
TH901	Fusing surface-temperature sensor

Solenoids and clutch

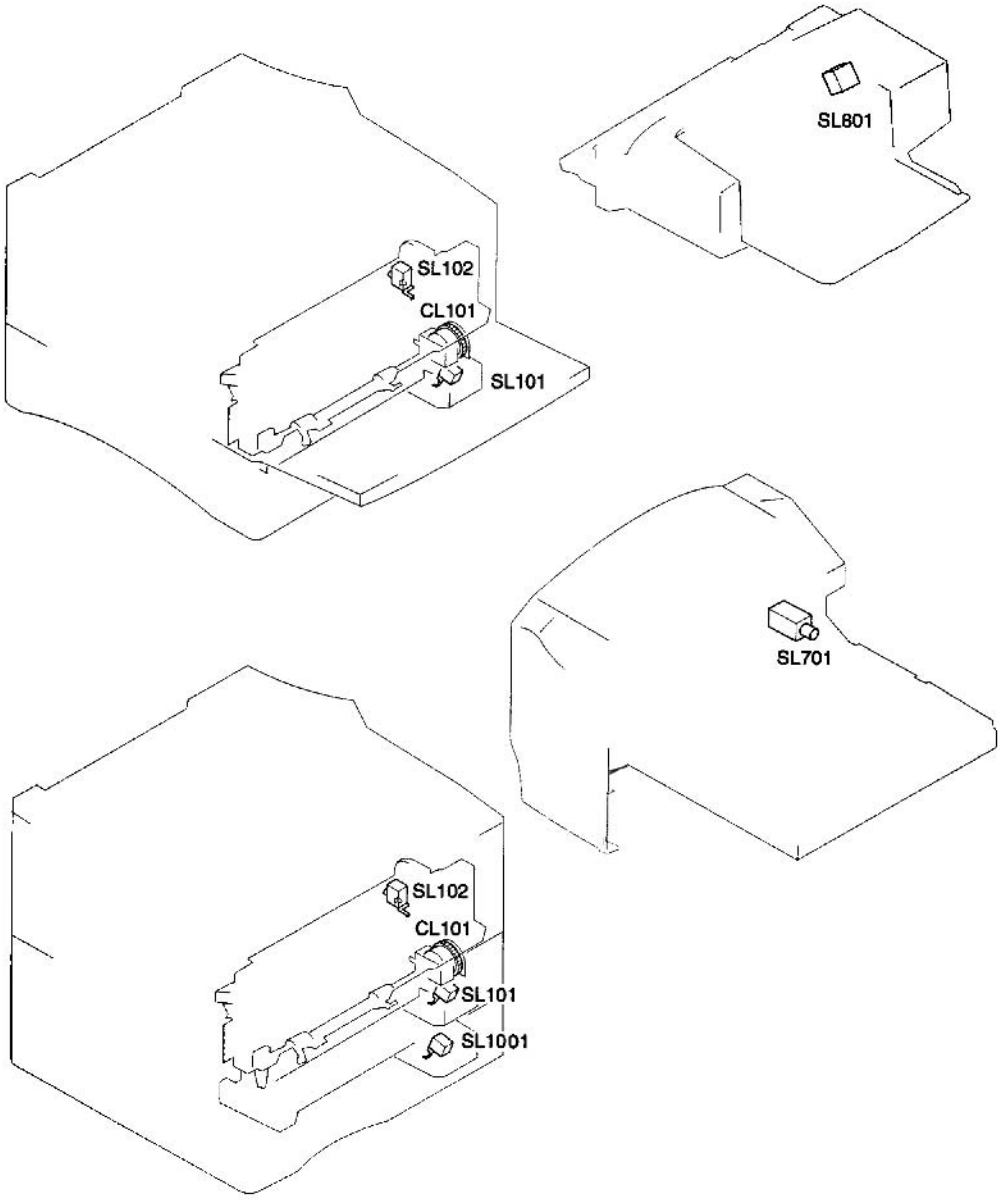

Figure 115. **Location of solenoids and clutch)**

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Table 51. Solenoids and clutch

CL101	Paper feed guide clutch
SL101	Tray 2 pickup solenoid
SL102	Tray 1 pickup solenoid
SL1001	Optional 500-sheet feeder pickup solenoid
SL701	Duplexer solenoid (duplexer)
SL801	Envelope pickup solenoid (envelope feeder)

Timing

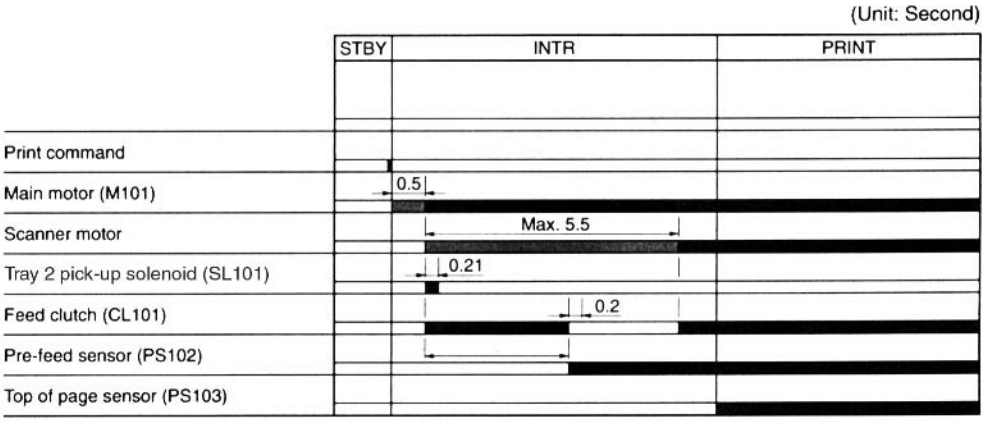

Figure 116. **Pickup timing for tray 2 (and lower trays)**

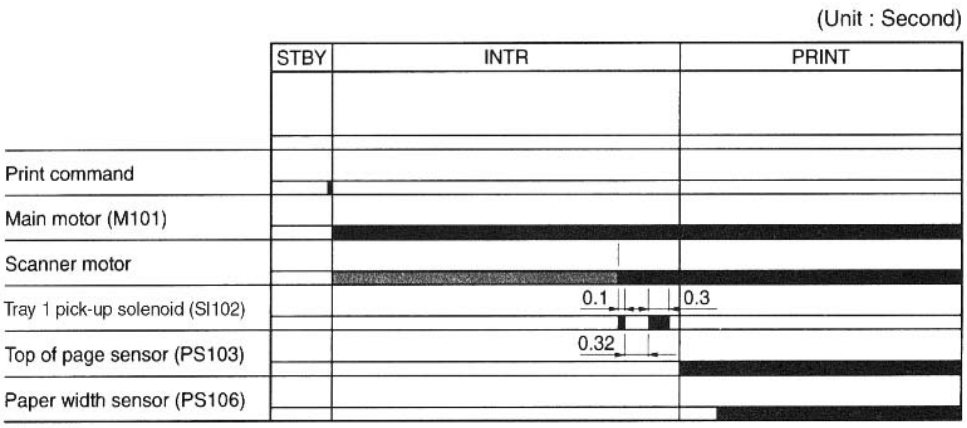

Figure 117. **Pickup timing for tray 1**

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8 Parts and diagrams

Chapter contents

How to use the parts lists and diagrams 270
Accessories and supplies 271
    Common screws and replacement cables 272
Illustrations and parts lists 274
    Alphabetical parts list 306
    Numerical parts list 313

How to use the parts lists and diagrams

The figures in this chapter illustrate the major subassemblies in the printer and their component parts. A table accompanies each exploded-view diagram. Each table lists the item number for the replaceable part, the associated part number for the item, the quantity, and a description of the part.

CAUTION While looking for an electrical part number, pay careful attention to the voltage listed in the description column to ensure that the part number selected is for the correct model of the printer.

Ordering parts

All standard part numbers listed are stocked and can be ordered from HP's Customer Services and Support Center.

Hewlett-Packard Co.
Customer Services and Support Center
8050 Foothills Blvd.
Roseville, CA 95678
Parts Direct Ordering: (1) (800) 227-8164 (U.S. Only)

Hewlett-Packard Co.
Customer Services and Support Center
Wolf-Hirth Strasse 33
D-7030
Boblingen, Germany
(49 7031) 14-2253

Ordering consumables

Consumables and accessories such as those listed in table 52 can be ordered from Hewlett-Packard.

The phone numbers are:

U.S.: (1) (800) 538-8787
Canada: (1) (800) 387-3154
(Toronto) (516) 671-8383
United Kingdom: 0734-441212
Germany: 0130-3322

Contact your local HP Parts Coordinator for other phone numbers.

Note Parts that have no item number or part number listed are not field replacement parts and cannot be ordered.

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Accessories and supplies

The following items are available through your local authorized HP dealer. To find a dealer near you, call the HP Customer Information Center at (1) (800) 752-0900.

Note See page 41 for documentation product numbers.

Table 52. Accessories and supplies

Description	Part no.	Exchange no.	Product no.
500-sheet paper feeder and tray	C8055-67901		C8055A
Envelope feeder		C8053-69001	C8053A
Duplexer		C8054-69001	C8054A
Standard 500-sheet tray (without the feeder)	C8056-67901		C8056A
HP multipurpose paper			HPM1120
HP LaserJet paper			HPJ1124
Toner cartridge (6,000 pages)			C8061A
Toner cartridge (10,000 pages)			C8061X
SDRAM DIMM 4 MB 8 MB 16 MB 32 MB 64 MB 128 MB	 C4140-67901 C4141-67901 C4142-67901 C4143-67901 C3913-67901 C9121-67901		 C4140A C4141A C4142A C4143A C3913A C9121A
Flash DIMM 2 MB 4 MB			 C4286A C4287A
Font DIMM (8 MB Asian MROM) Traditional Chinese Simplified Chinese Korean			 C4292A C4293A D4838A
FIR receiver			C4103A
EIO hard disk			J6054A
Parallel cables 2-meter IEEE-1284 cable 3-meter IEEE-1284 cable			 C2950A C2951A
Macintosh computer serial cable			92215S
Macintosh network cable kit			92215N
Enhanced I/O Cards Token Ring networks Fast Ethernet (10/100Base-TX single RJ-45 port) HP JetDirect Connectivity card (EIO) for USB, Serial, LocalTalk			 J4167A J4169A J4135A

Table 52. Accessories and supplies (continued)

Description	Part no.	Exchange no.	Product no.
Maintenance kit 110 V 220 V		 C8057-69001 C8058-69001	 C8057A C8058A

Common screws and replacement cables

Table 53. Screws used in the printer

Description	Part no.
Screw, M4x10, self-tapping	XA9-0870-000CN
Screw, M3x6, washer head, engine controller board	XA9-1016-000CN
Screw, M4x12, self-tapping, pan head	XB4-7401-207CN
Screw, M4x8.3, long, module	RB2-5013-000CN
Screw, M4x10, self-tapping	XA9-0606-000CN
Screw, TP, M3x8, main motor	XB6-7300-807CN
Screw, stepped, M4, formatter	XA9-1143-000CN
Screw, truss head w/washer, machine, grounding	FA9-1449-000CN
Screw, M4x10, self-tapping, feeder assembly	FA9-2753-000CN

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Table 54. Replaceable cables

Description	Part no.	Table no.	Item no.
Cable and power receptacle 110 V 220 V	 RG5-5111-000CN RG5-5280-000CN	Table 58 on page 281	19
Cable, tray 1 sensor	RG5-5341-000CN	Table 58 on page 281	7
Cable, laser scanner	RG5-5348-000CN	Table 59 on page 283	7
Cable, envelope feeder connect	RG5-5344-000CN	Table 58 on page 281	9
Cable, top cover switch	RG5-5345-000CN	Table 58 on page 281	10
Cable, feed/registration sensors	RG5-5357-000CN	Table 59 on page 283	6
Cable, assembly, formatter	RG5-5351-000CN	Table 58 on page 281	12
Cable, main motor	RG5-5346-000CN	Table 58 on page 281	11
Cable, output bin sensor	RG5-5349-000CN	Table 59 on page 283	8
Cable, laser	RG5-5350-000CN	Table 59 on page 283	9
Cable, memory	RG5-5470-000CN	Table 59 on page 283	10
Cable, antenna	RG5-5471-000CN	Table 60 on page 285	9
Cable, duplexer	RG5-5358-000CN	Table 60 on page 285	10
Cable, paper feeder	RG5-3822-000CN	Table 70 on page 299	9
Cable, paper feeder w/ connector	RG5-3712-000CN	Table 61 on page 287	11
Cable, paper feeder sensor	RG5-3711-000CN	Table 61 on page 287	10

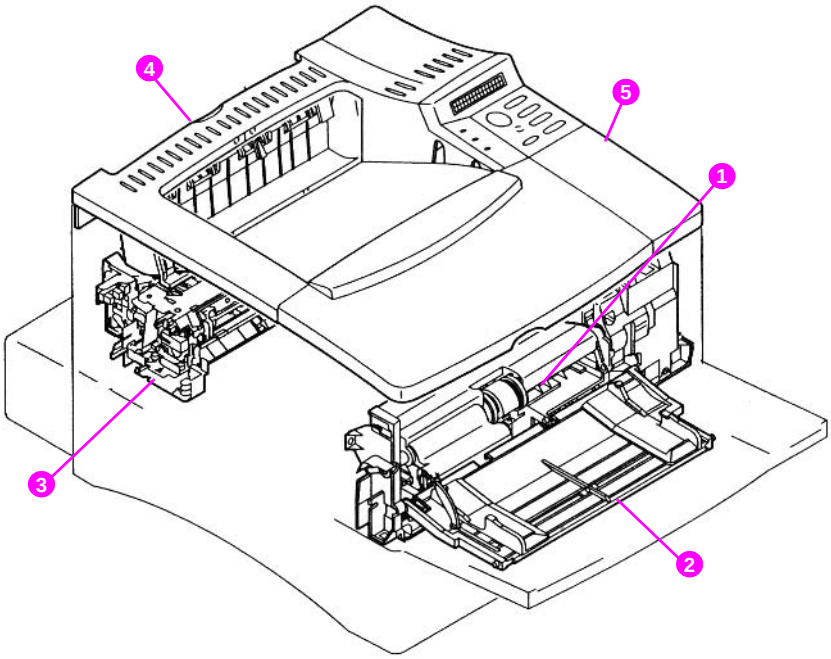

Figure 118. **Assembly location diagram (1 of 2)**

1 Tray 1 pickup assembly

2 Tray 1 assembly

3 Fuser assembly

4 Paper delivery assembly

5 Top cover assembly

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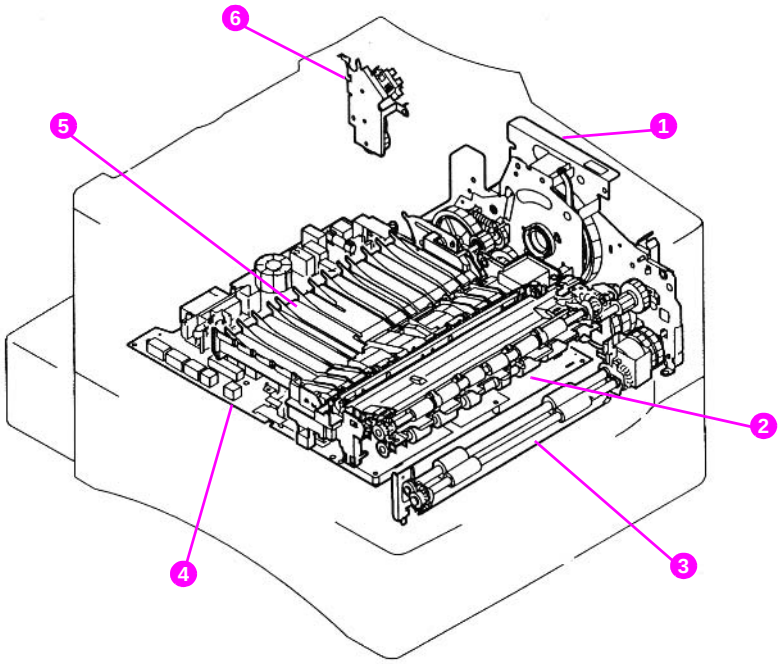

Figure 119. **Assembly location diagram (2 of 2)**

1 Main gear assembly

2 Registration assembly

3 Paper feed assembly

4 Engine controller board assembly

5 Paper guide assembly

6 Delivery drive assembly

Table 55. Assemblies (listed alphabetically) and their part numbers

Description	Part no.	Exchange no.	Exploded view in figure
Delivery drive assembly	RG5-5095-000CN		Figure 127 on page 289
EIO cover	5021-0349		N/A
Engine controller board	RG5-5361-000CN (110 V) RG5-5362-000CN (220 V)	C8049-69003 (110 V) C8049-69004 (220 V)	Figure 126 on page 288
Firmware DIMM kit[1]	C4168-67901		N/A
Formatter assembly[1]	C4169-67901	C4169-69001	N/A
Fuser	RG5-5063-000CN (110 V) RG5-5064-000CN (220 V)	C8049-69001 (110 V) C8049-69002 (220 V)	Figure 133 on page 296; Figure 134 on page 297
Laser scanner assembly	RG5-5100-000CN	C8049-69005	Figure 123 on page 282
Tray 1 assembly	RG5-2656-080CN		Figure 122 on page 280
Tray 1 pickup assembly	RG5-5084-000CN		Figure 130 on page 292
Paper delivery	RG5-5094-000CN		Figure 132 on page 295
Paper feed assembly	RG5-5086-000CN		Figure 124 on page 284
Paper feed guide assembly	RG5-5083-000CN		Figure 131 on page 294
Registration	RG5-5085-000CN		Figure 124 on page 284
Top cover	RG5-2663-080CN		Figure 121 on page 278

1. The formatter does not include onboard firmware; it requires a separate firmware DIMM.

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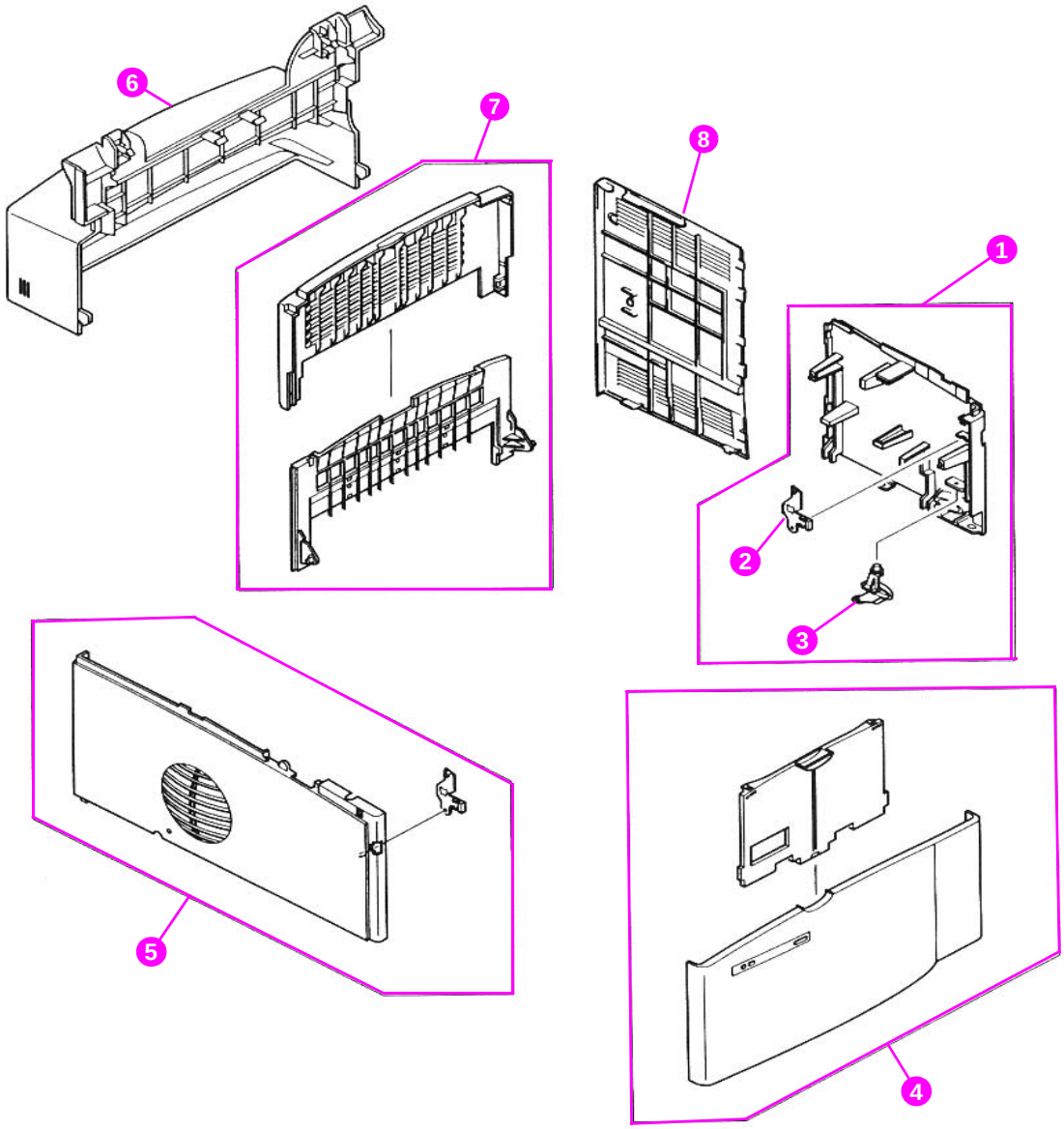

Figure 120. **External covers and panels**

Table 56. External covers and panels

Item no.	Part no.	Quantity	Description
1	RG5-2664-020CN	1	Cover assembly, right front
2	RB1-8860-000CN	1	Clip, right side panel
3	RB1-8849-000CN	1	Power switch button
4	RG5-2667-070CN	1	Tray 1 door assembly
5	RG5-5098-000CN	1	Cover assembly, left
6	RB2-4827-000CN	1	Cover, tray 2
7	RG5-5097-000CN	1	Tray assembly, rear
8	RB1-8858-000CN	1	Panel, formatter cover

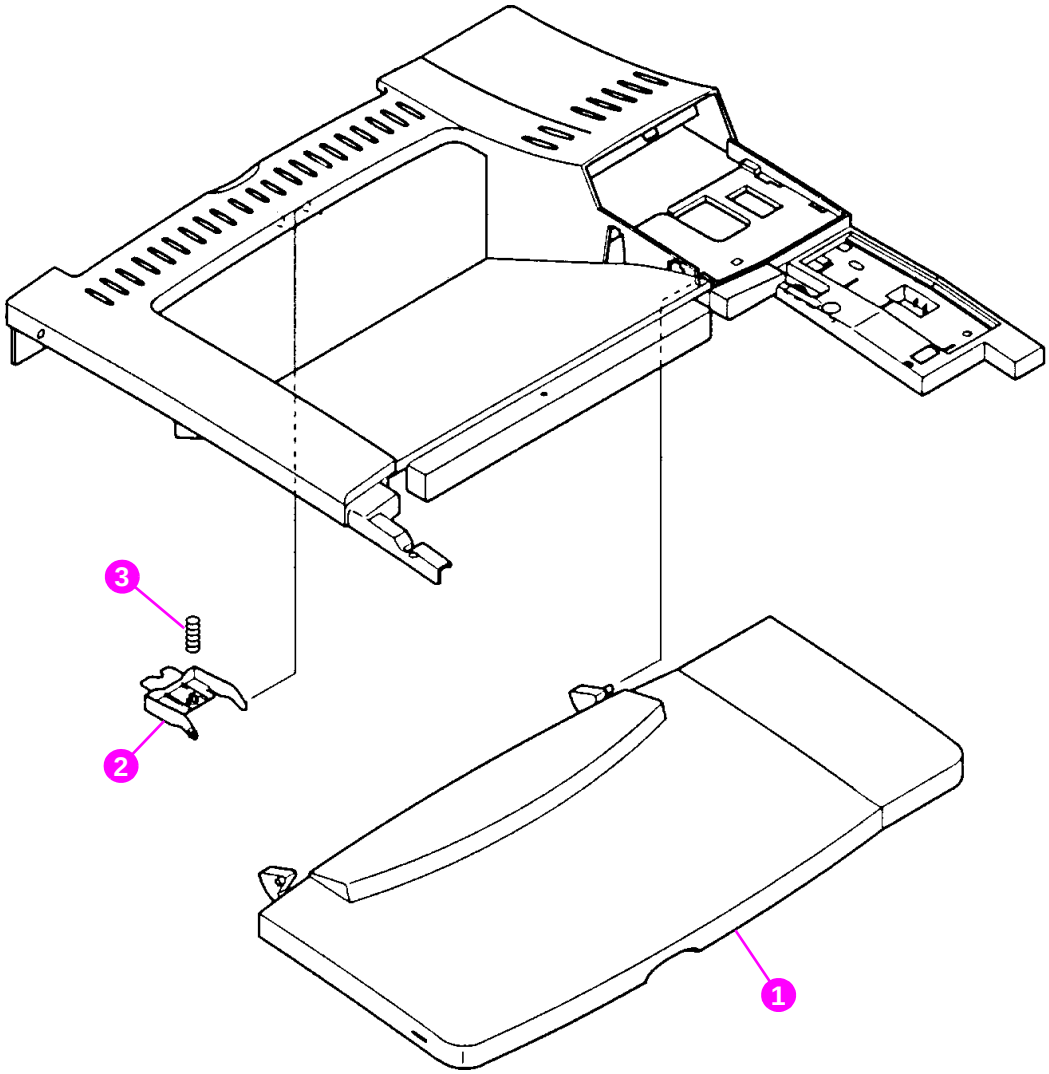

Figure 121. **Top cover assembly**

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Table 57. Top cover assembly

Item no.	Part no.	Quantity	Description
	RG5-2663-080CN	1	Top cover assembly
1	RB1-8841-000CN	1	Panel, toner cartridge access
2	RB1-8846-000CN	1	Latch, rear tray
3	RB1-8847-000CN	1	Spring, rear tray latch

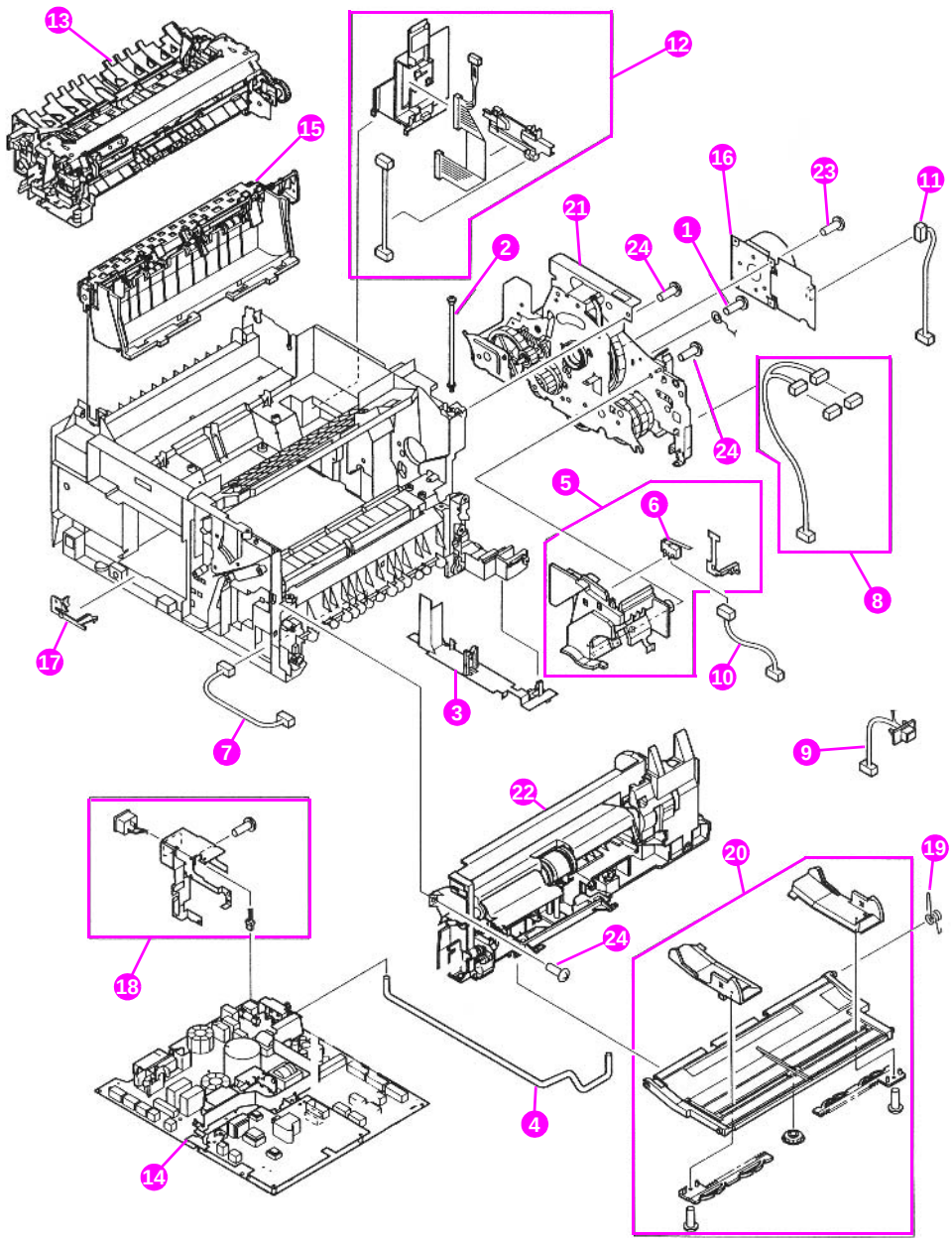

Figure 122. **Internal components (1 of 4)**

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Table 58. Internal components (1 of 4)

Item no.	Part no.	Quantity	Description
1	FA9-1449-000CN	4	Screw, truss head, w/washer, grounding
2	RB2-5013-000CN	2	Screw, M4 x 8.3
3	RB1-8704-030CN	1	Guide, bottom cable
4	RB1-8851-000CN	1	Power switch rod
5	RG5-5274-000CN	1	Front inner cover assembly
6	WC4-5139-000CN	1	Switch, top cover interlock access
7	RG5-5341-000CN	1	Cable, tray 1 sensor
8	RG5-5343-000CN	1	Cable, paper feed/tray 1 pickup solenoid
9	RG5-5344-000CN	1	Cable, envelope feeder connect
10	RG5-5345-000CN	1	Cable, top cover switch
11	RG5-5346-000CN	1	Cable, main motor
12	RG5-5351-000CN	1	Cable, assembly, formatter
13	C8049-69001 C8049-69002	1 1	Fusing assembly (110 V) Fusing assembly (220 V)
14	C8049-69003 C8049-69004	1 1	Engine controller board (110 V) Engine controller board (220 V)
15	RG5-5094-000CN	1	Delivery assembly
16	RH7-1440-000CN	1	Main motor assembly
17	RB2-4986-000CN	1	Clip, fan
18	RG5-5111-000CN RG5-5280-000CN	1 1	AC, power receptacle (110 V) AC, power receptacle (220 V)
19	RB2-4122-000CN	1	Hinge spring, tray
20	RG5-2656-080CN	1	Tray 1 assembly
21	RG5-5087-000CN	1	Printer drive assembly
22	RG5-5084-000CN	1	Tray 1 pickup assembly
23	XB6-7300-807CN	4	Screw, TP, M3x8, main motor
24	XB4-7401-207CN	31	Screw, tapping, pan head, M4x12

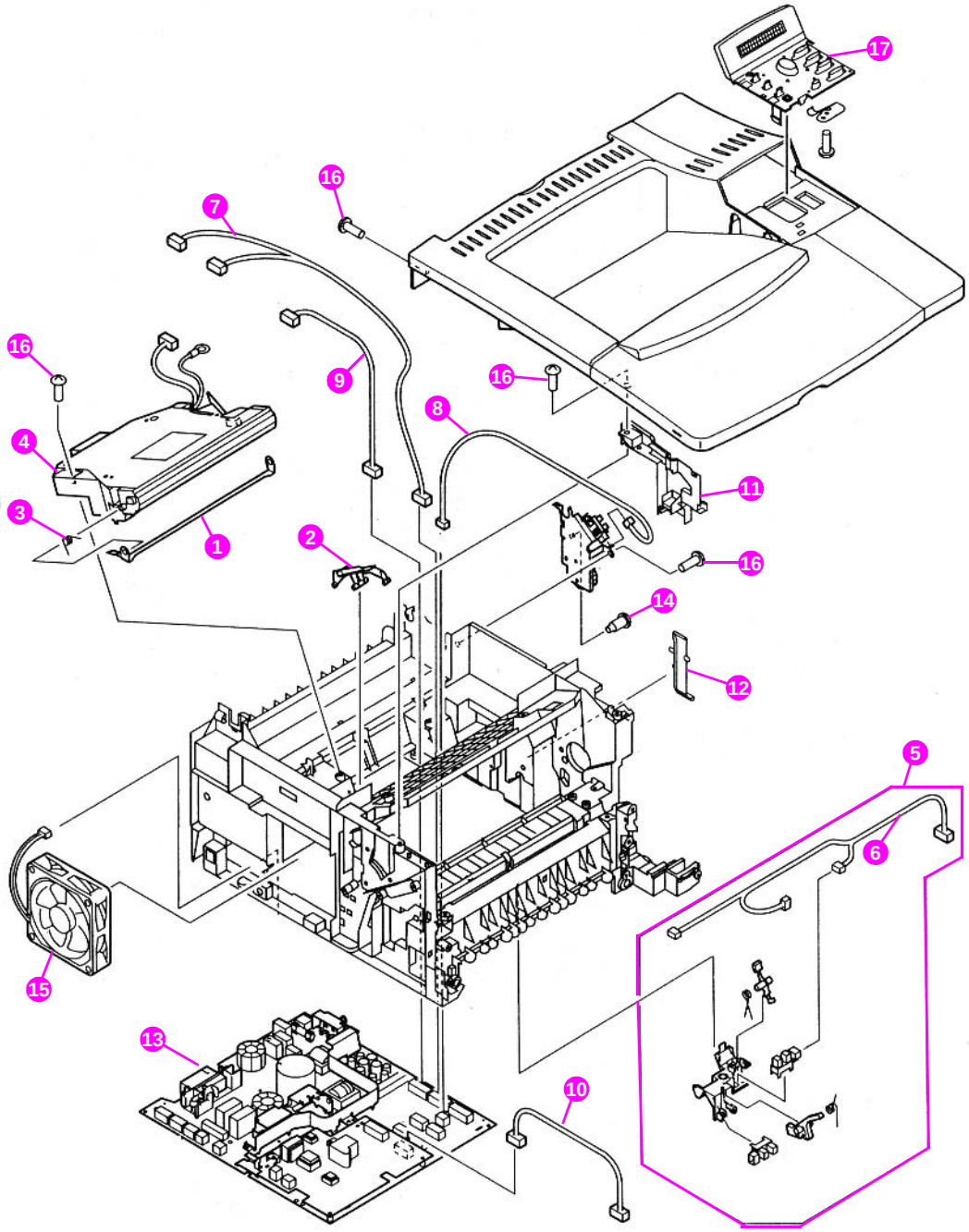

Figure 123. **Internal components (2 of 4)**

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Table 59. Internal components (2 of 4)

Item no.	Part no.	Quantity	Description
1	RB1-8699-000CN	1	Shutter
2	RB1-8700-000CN	1	Laser shutter arm
3	RB1-8702-000CN	1	Spring, shutter
4	RG5-5100-000CN	1	Laser scanner assembly
5	RG5-5275-000CN	1	Registration/feed sensor assembly
6	RG5-5357-000CN	1	Cable, feed/registration sensors
7	RG5-5348-000CN	1	Cable, scanner
8	RG5-5349-000CN	1	Cable, output bin sensor
9	RG5-5350-000CN	1	Cable, laser
10	RG5-5470-000CN	1	Cable, memory
11	RB2-5003-000CN	1	Support, top cover, left
12	RB2-4992-000CN	1	Cable holder, formatter
13	C8049-69003 C8049-69004	1 1	Engine controller board (110 V) Engine controller board (220 V)
14	XA9-1143-000CN	2	Screw, stepped, M4, formatter
15	RH7-1442-000CN	1	Fan, main cooling
16	XB4-7401-207CN	31	Screw, tapping, pan head, M4x12
17	RG5-5372-040CN	1	Control panel, assembly

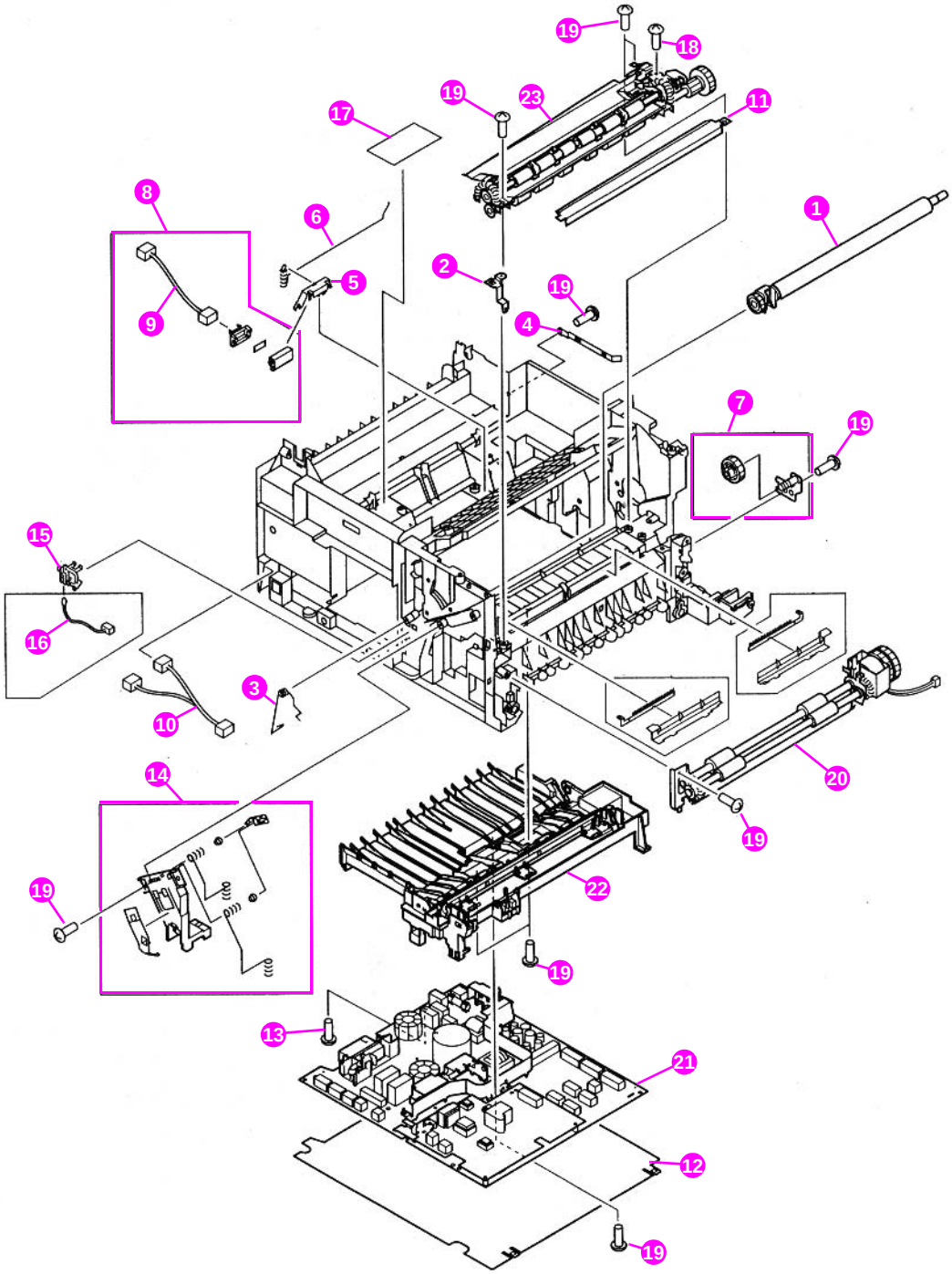

Figure 124. **Internal components (3 of 4)**

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Table 60. Internal components (3 of 4)

Item no.	Part no.	Quantity	Description
1	RG5-5295-000CN	1	Transfer roller assembly
2	RB2-4969-000CN	1	Plate, registration ground
3	RB2-4997-000CN	1	Spring, toner cartridge ground
4	RB2-5002-000CN	1	Plate, continuity
5	RB2-5008-000CN	1	Cartridge memory antenna bracket
6	RB2-5009-000CN	1	Spring, cartridge memory assembly
7	RG5-3723-000CN	1	MP idler assembly
8	RG5-5276-000CN	1	Cartridge memory antenna assembly
9	RG5-5471-000CN	1	Antenna cable
10	RG5-5358-000CN	1	Cable, duplexer
11	RB2-5043-000CN	1	Lower transfer-roller guide
12	RB2-4975-000CN	1	Insulation, engine controller board
13	XA9-1016-000CN	3	Screw w/washer, M3x6, engine controller
14	RG5-5273-000CN	1	Antenna assembly
15	RB2-4996-000CN	1	Mount, thermistor
16	RH7-7116-000CN	1	Thermistor, environmental
17	RG5-5468-000CN	1	PCB, memory controller
18	FA9-1449-000CN	1	Screw, truss head, w/washer, grounding
19	XB4-7401-207CN	5	Screw, tapping, pan head, M4x12
20	RG5-5086-000CN	1	Paper feed assembly
21	C8049-69003 C8049-69004	1 1	Engine controller board (110 V) Engine controller board (220 V)
22	RG5-5083-000CN	1	Paper feed guide assembly
23	RG5-5085-000CN	1	Registration assembly

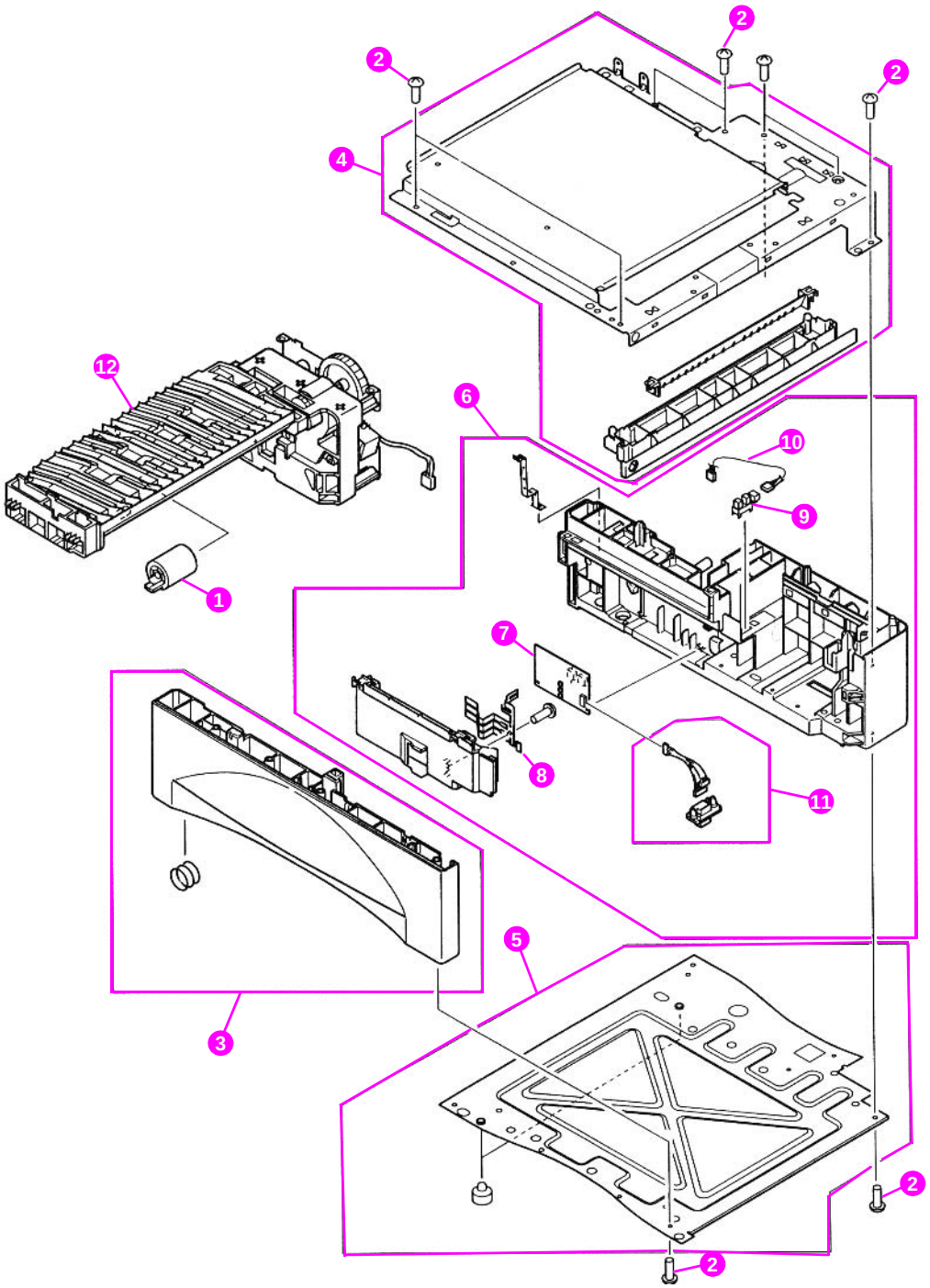

Figure 125. **Internal components (4 of 4)**

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Table 61. Internal components (4 of 4)

Item no.	Part no.	Quantity	Description
1	RF5-3114-000CN	1	Roller, feed
2	XA9-0870-000CN	12	Screw, M4x10
3	RG5-2669-000CN	1	Left frame assembly, tray 2
4	RG5-5072-000CN	1	Upper frame assembly, tray 2
5	RG5-5271-000CN	1	Lower frame assembly
6	RG5-5278-000CN	1	Right frame assembly, tray 2
7	RG5-2673-004CN	1	Paper-size detection PCB assembly, tray 2
8	RB2-4837-000CN	1	Spring, leaf
9	WG8-5362-000CN	1	Photo-interrupter, TLP1241
10	RG5-3711-000CN	1	Cable, paper feeder sensor
11	RG5-3712-000CN	1	Cable, paper feed with connector
12	RG5-5277-000CN	1	Paper pickup guide assembly, tray 2 (figure 129 on page 291)

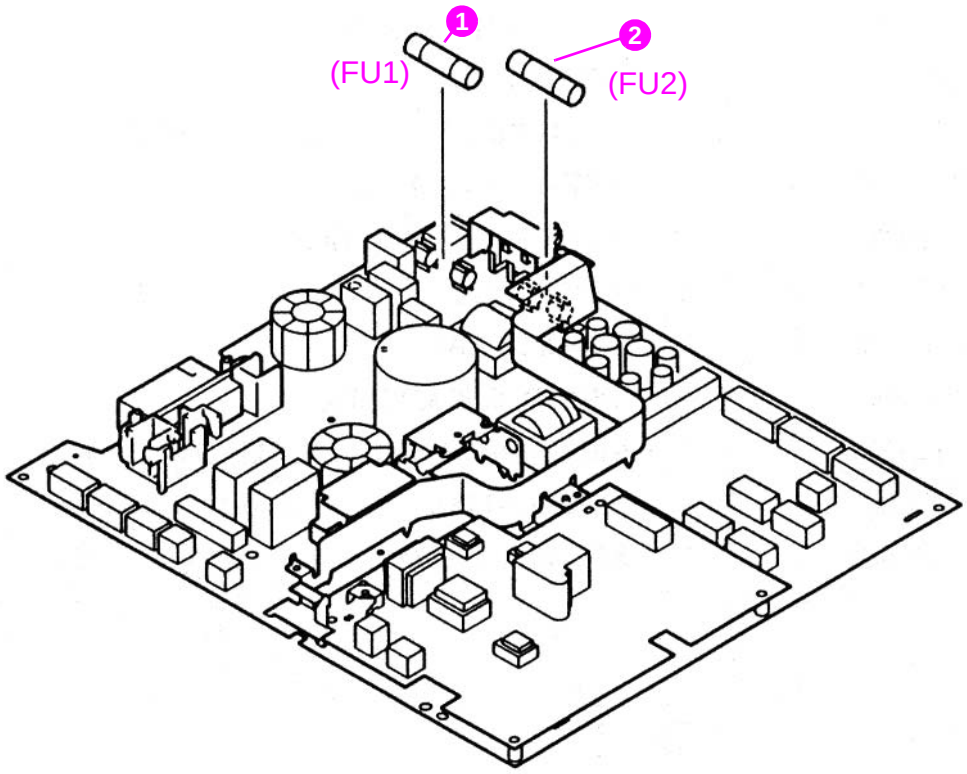

Figure 126. **Engine controller board assembly**

Table 62. Engine controller board assembly

Item no.	Part no.	Exchange no.	Quantity	Description
	RG5-5361-000CN	C8049-69003	1	Engine controller board assembly (110 V)
	RG5-5362-000CN	C8049-69004	1	Engine controller board assembly (220 V)
1	RH3-8006-000CN WD1-0268-000CN		1 1	Fuse, 220 V, Engine Board Fuse, 110 V, Engine Board
2	VD7-0256-001CN VD7-0643-151CN		1 1	Fuse, 110 V, Engine Fuse, 220 V, Engine

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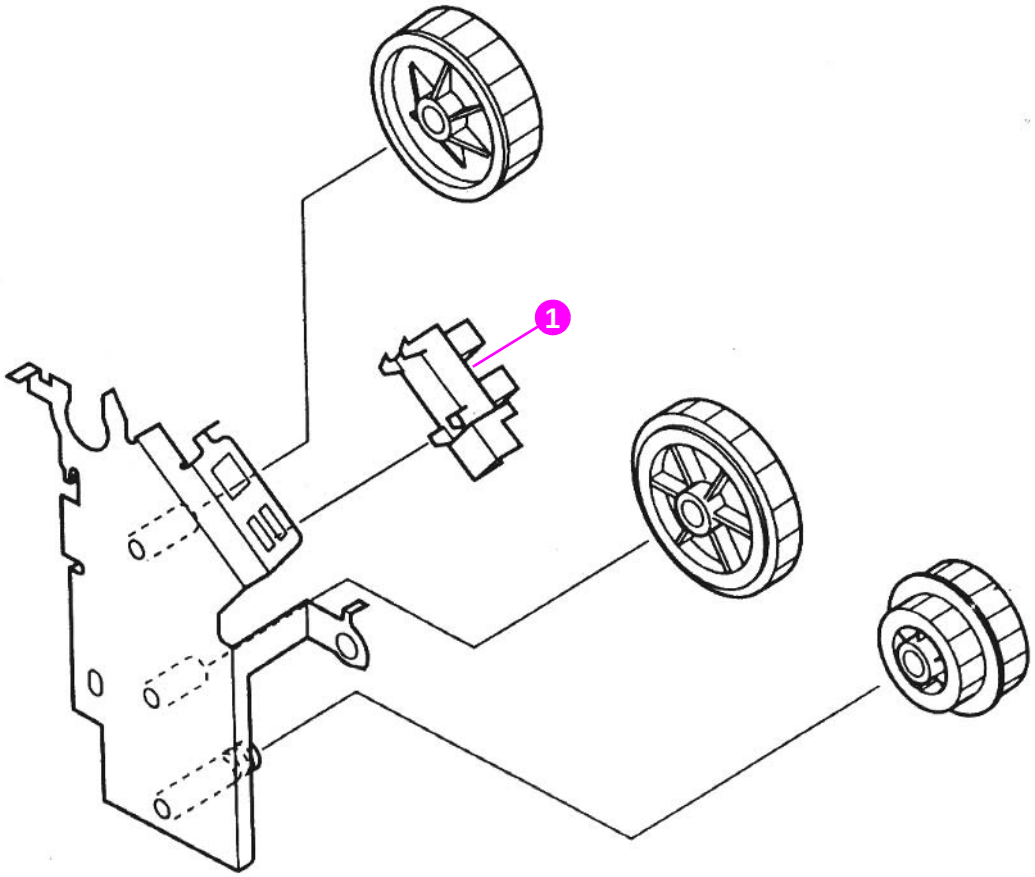

Figure 127. **Delivery drive assembly**

Table 63. Delivery drive assembly

Item no.	Part no.	Quantity	Description
	RG5-5095-000CN	1	Delivery drive assembly
1	WG8-5362-000CN	1	Sensor, optical, included in assembly

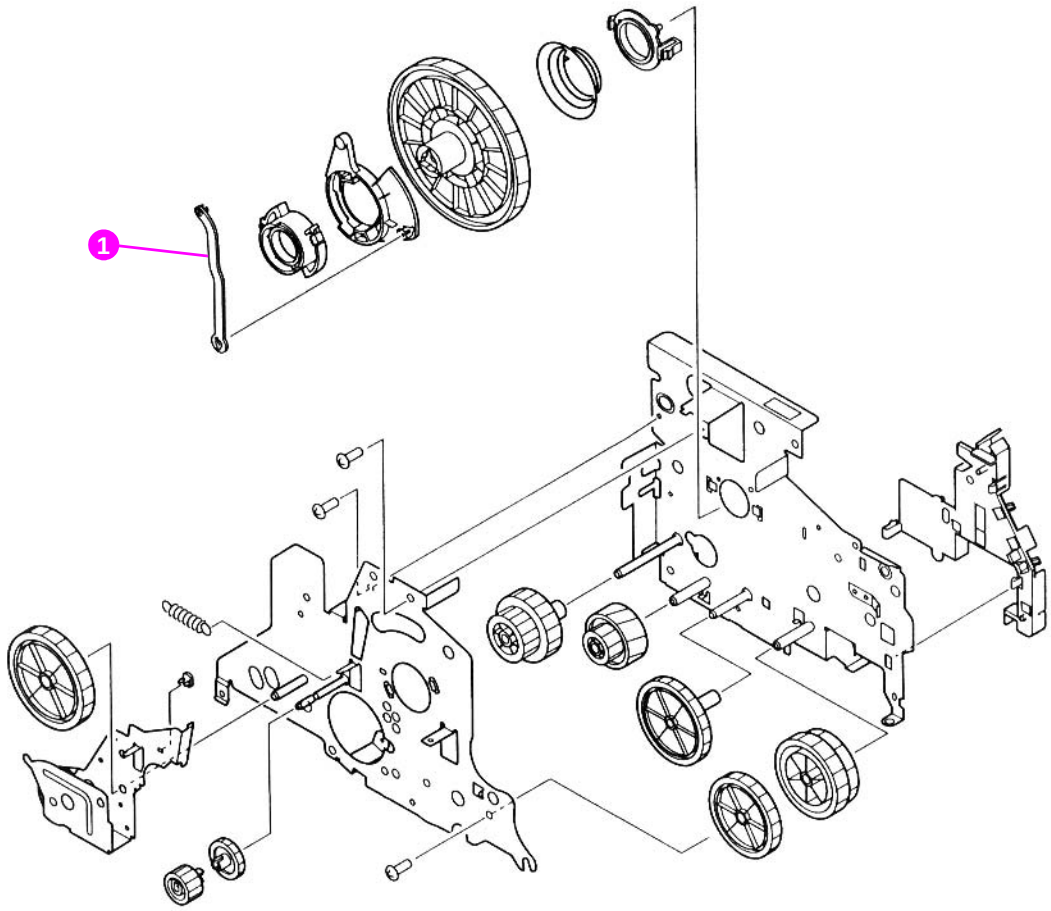

Figure 128. **Printer drive assembly**

Table 64. Printer drive assembly

Item no.	Part no.	Quantity	Description
	RG5-5087-000CN	1	Printer drive assembly
1	RB1-8756-000CN	1	Rod, toner drive, included in assembly

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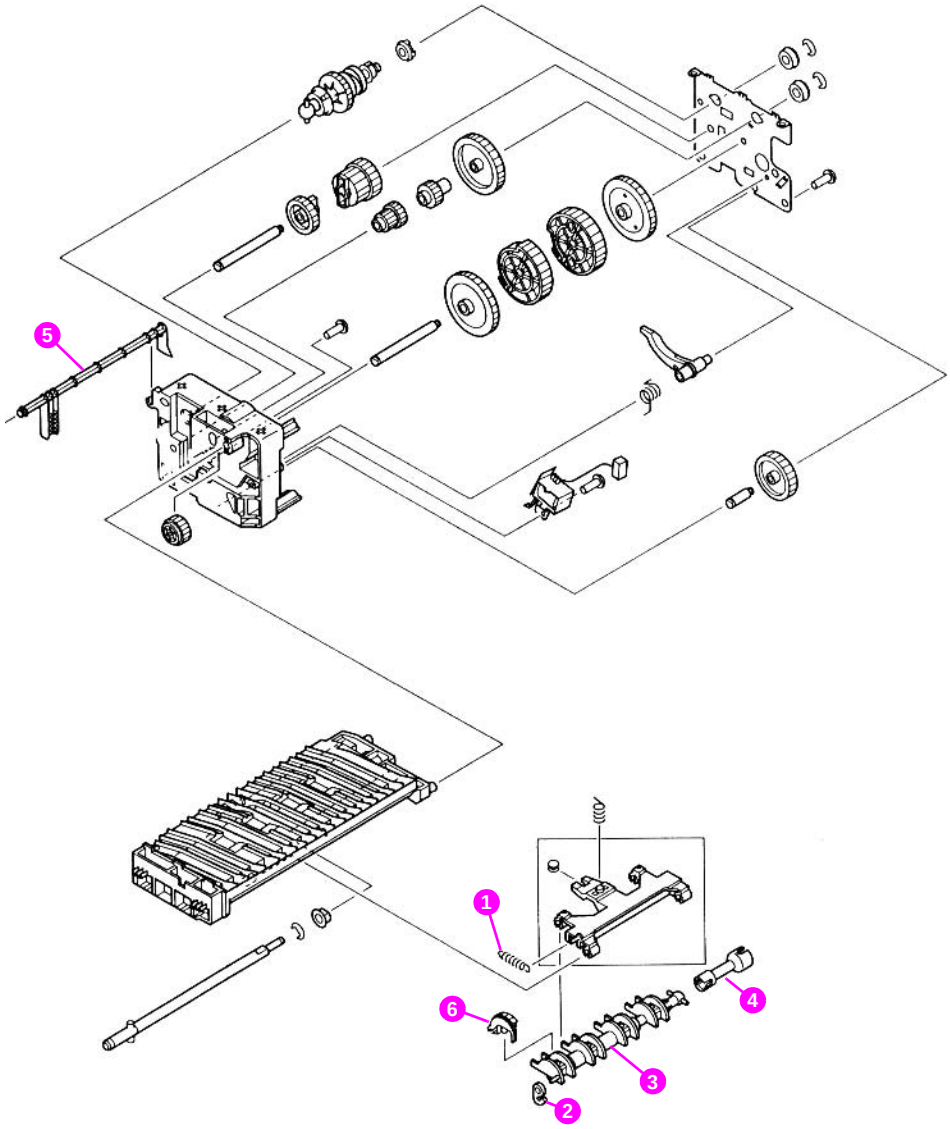

Figure 129. **Tray 2 paper pickup guide assembly**

Table 65. Paper pickup guide assembly

Item no.	Part no.	Quantity	Description
	RG5-5277-000CN	1	Paper pickup guide assembly, tray 2
1	RS5-2632-000CN	1	Spring, tension
2	RB1-2190-000CN	1	Clip, pickup spring
3	RB1-8867-000CN	1	Shaft, roller
4	RB1-8877-000CN	1	Joint
5	RB1-8879-000CN	1	Arm, tray sensing
6	RB1-8957-000CN	4	Pickup roller

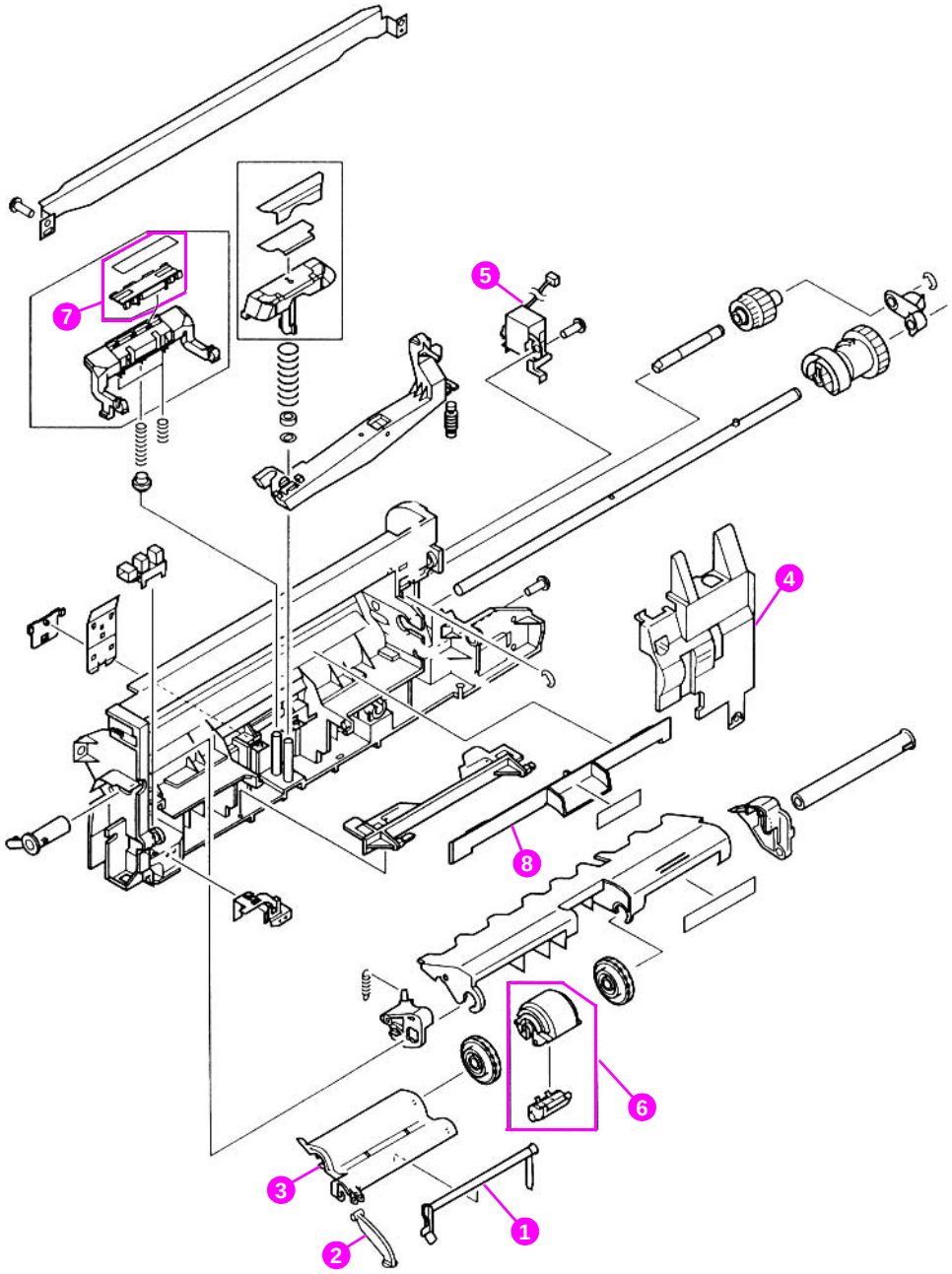

Figure 130. **Tray 1 pickup assembly**

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Table 66. Tray 1 pickup assembly

Item no.	Part no.	Quantity	Description
	RG5-5084-000CN	1	Tray 1 pickup assembly
1	RB1-8787-050CN	1	Arm, tray 1 paper sensing
2	RB2-2387-000CN	1	Arm, tray 1 retaining
3	RB2-5040-000CN	1	Cover, tray 1 sensor arm
4	RB2-5019-000CN	1	Gear cover
5	RH7-5172-000CN	1	Solenoid, tray 1 drive
6	RG5-3718-000CN	1	Tray 1 pickup roller assembly
7	RF5-3086-000CN	1	Pad, separation
8	RB2-5037-000CN	1	Cover, envelope feeder

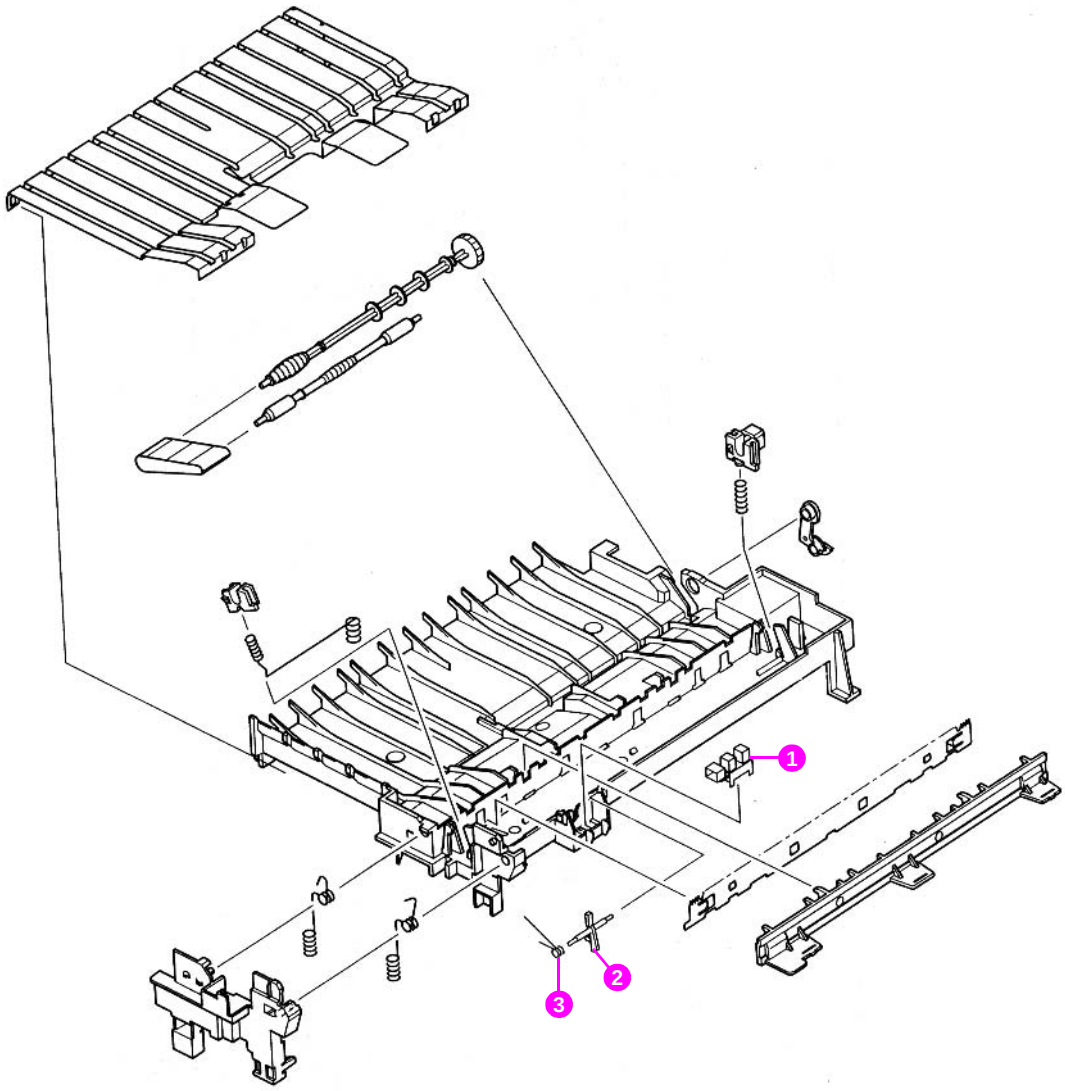

Figure 131. **Paper feed guide assembly**

Table 67. Paper feed assembly

Item no.	Part no.	Quantity	Description
	RG5-5083-000CN	1	Paper feed guide assembly
1	WG8-5362-000CN	1	Photo-interrupter
2	RB2-5034-000CN	1	Flag, sensor
3	RB2-5035-000CN	1	Spring, torsion

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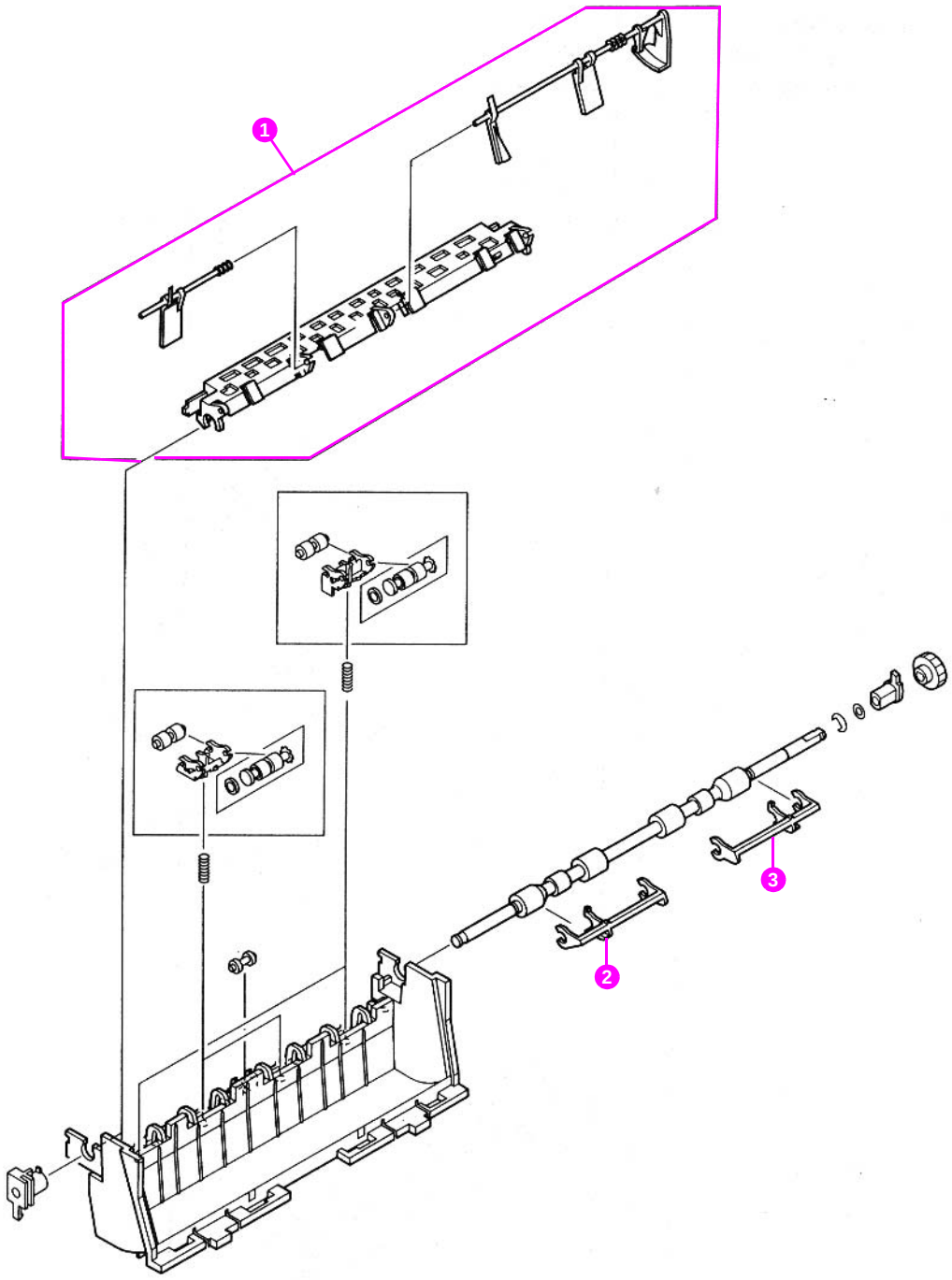

Figure 132. **Delivery assembly**

Table 68. Delivery assembly

Item no.	Part no.	Quantity	Description
	RG5-5094-000CN	1	Delivery assembly
1	RG5-5093-000CN	1	Delivery sensor arm assembly
2	RB2-4948-000CN	1	Arm, output kicker, left
3	RB2-4949-000CN	1	Arm, output kicker, right

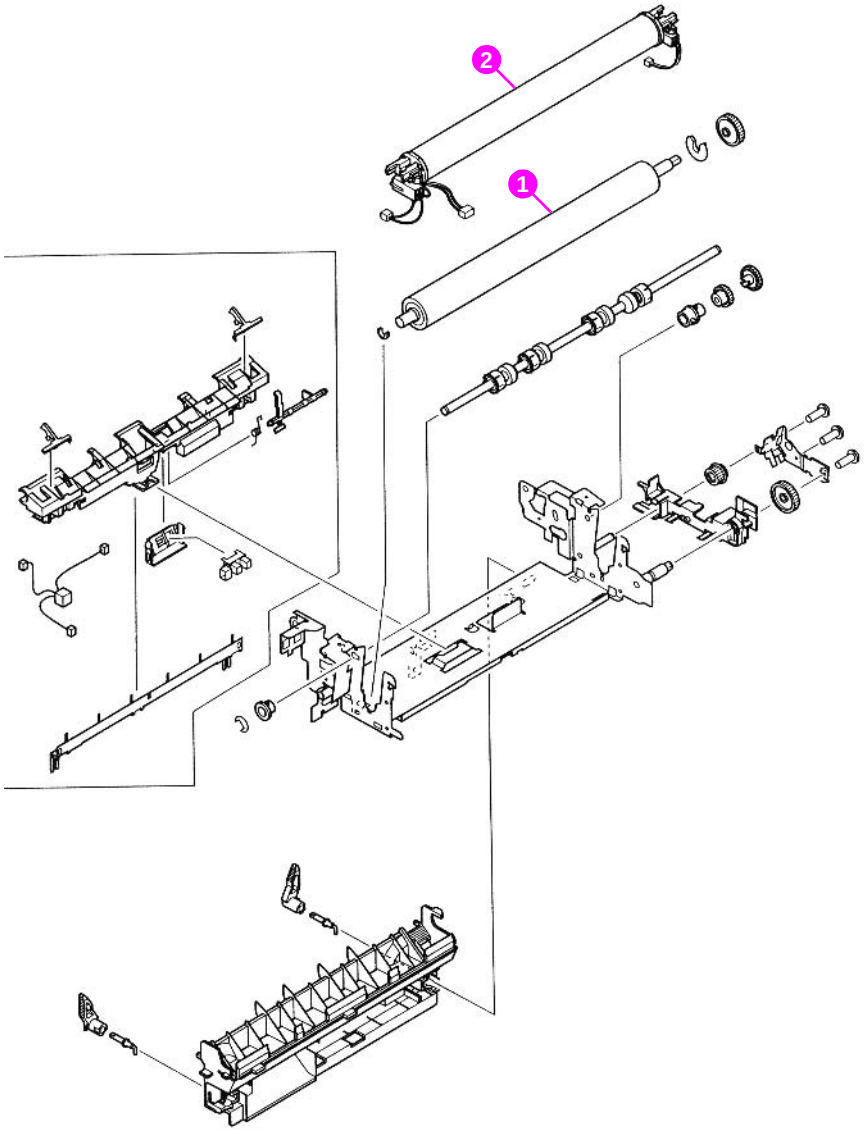

Figure 133. **Fuser assembly (1 of 2)**

Table 69. Fuser assembly

Item no.	Part no.	Exchange no.	Quantity	Description
	RG5-5063-000CN RG5-5064-000CN	C8049-69001 C8049-69002	1 1	Fuser (110 V) Fuser (220 V)
1	RB2-4919-000CN		1	Roller, pressure
2	RG5-5068-000CN RG5-5069-000CN		1 1	Fuser film assembly (110 V) Fuser film assembly (220 V)

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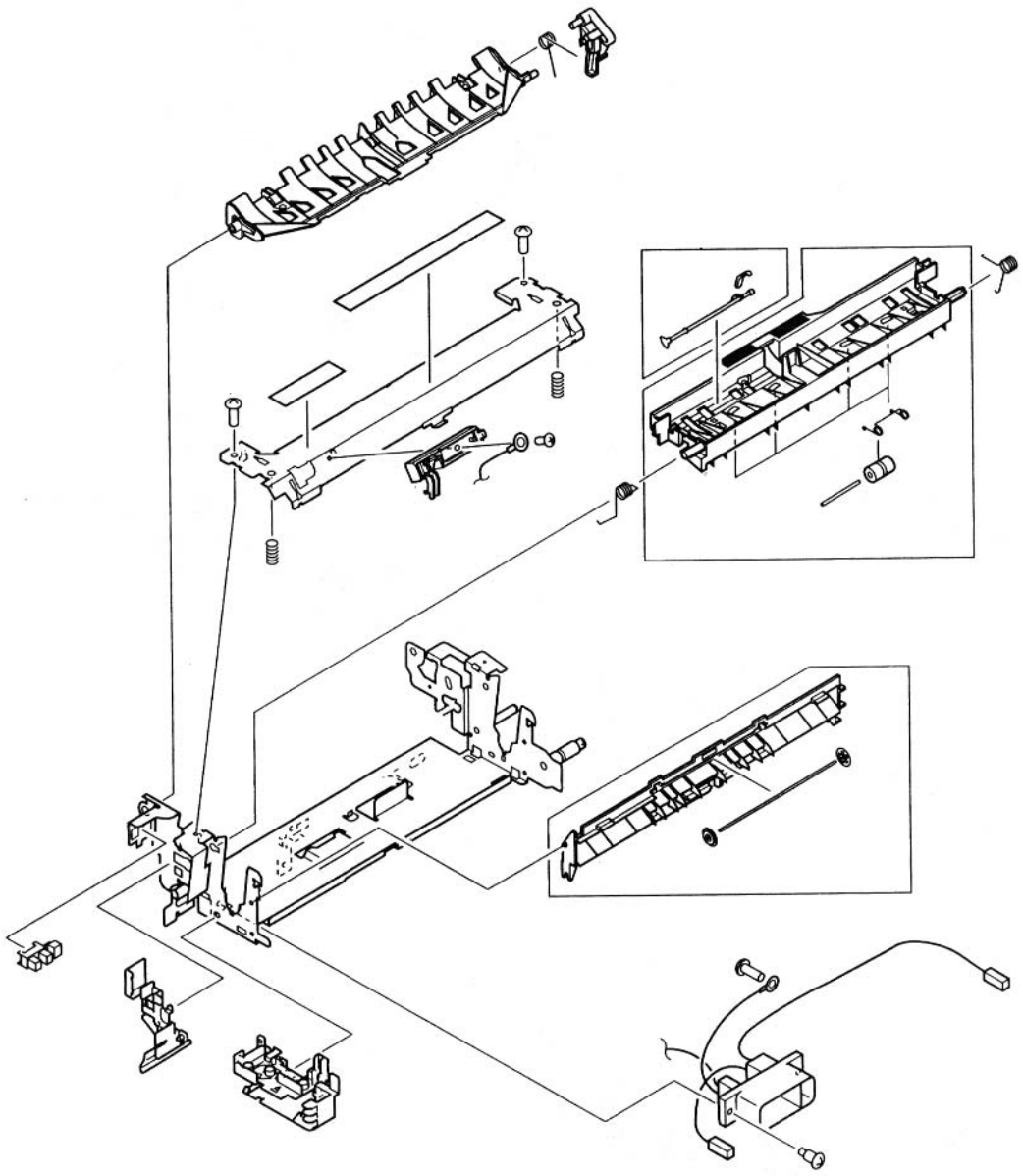

Figure 134. **Fuser assembly (2 of 2)**

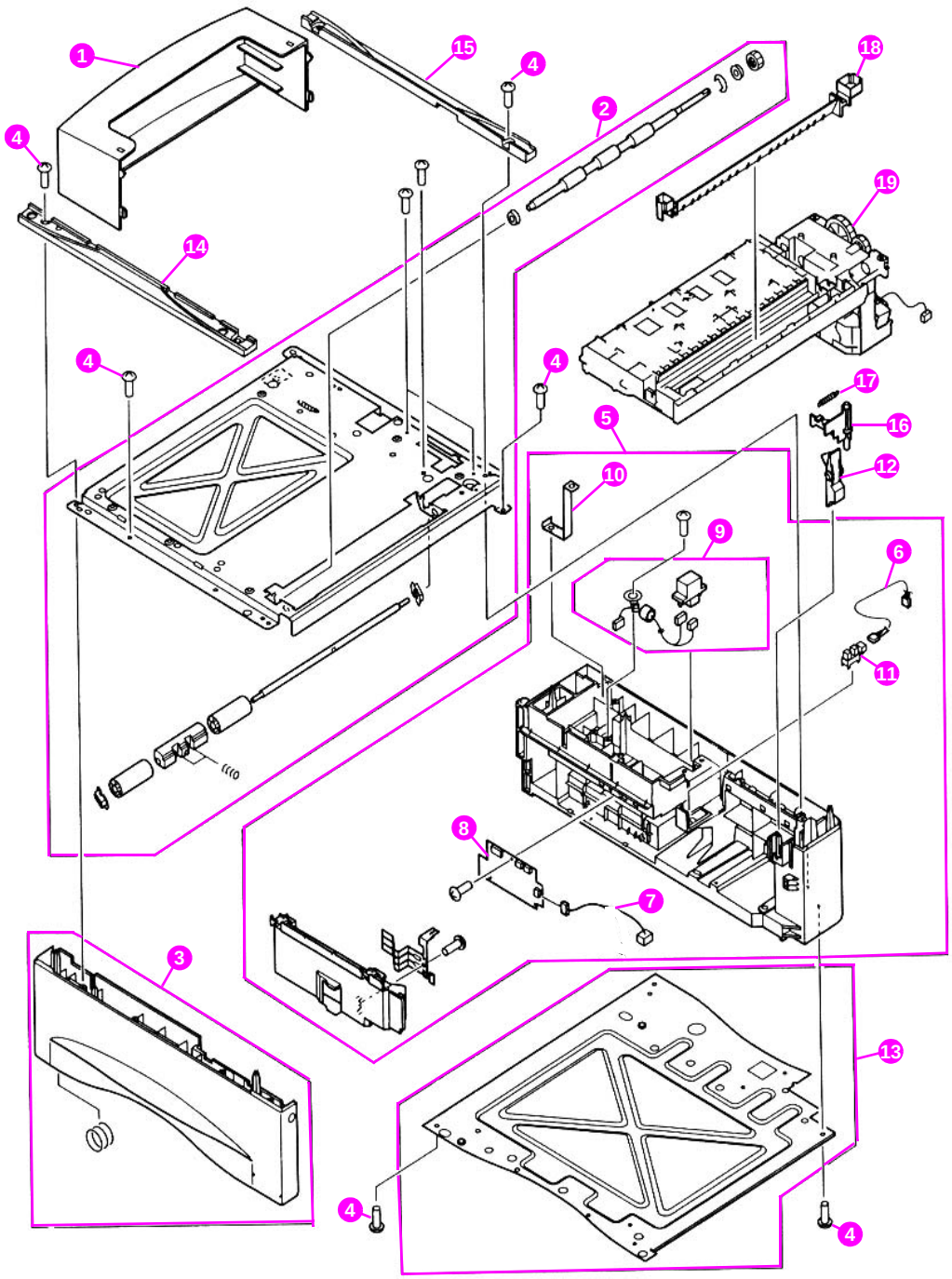

Figure 135. **Internal components of optional 500-sheet feeder**

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Table 70. Internal components of optional 500-sheet feeder

Item no.	Part no.	Quantity	Description
1	RB2-4836-000CN	1	Cover, tray
2	RG5-2689-000CN	1	Upper frame assembly, optional 500-sheet feeder
3	RG5-5292-000CN	1	Left frame assembly, optional 500-sheet feeder
4	FA9-2753-000CN	19	Screw, M4x10
5	RG5-5291-000CN	1	Right frame assembly, optional 500-sheet feeder
6	RG5-3711-000CN	1	Paper sensor cable
7	RG5-3712-000CN	1	Paper feeder cable
8	RG5-5539-000CN	1	Paper feeder PCA, optional 500-sheet feeder
9	RG5-3822-000CN	1	Paper feeder cable
10	RB1-9397-000CN	1	Plate, grounding
11	WG8-5362-000CN	1	Photo-sensor
12	RB2-3497-000CN	1	Lever, release
13	RG5-5271-000CN	1	Lower frame assembly
14	RB1-8924-000CN	1	Cover, grip, left
15	RB1-9385-000CN	1	Cover, grip, right
16	RB2-2412-000CN	1	Lever
17	RS5-2658-000CN	1	Spring, tension
18	RB1-8914-000CN	1	Guide, paper
19	RG5-5293-000CN	1	Paper pickup guide assembly, optional 500-sheet feeder

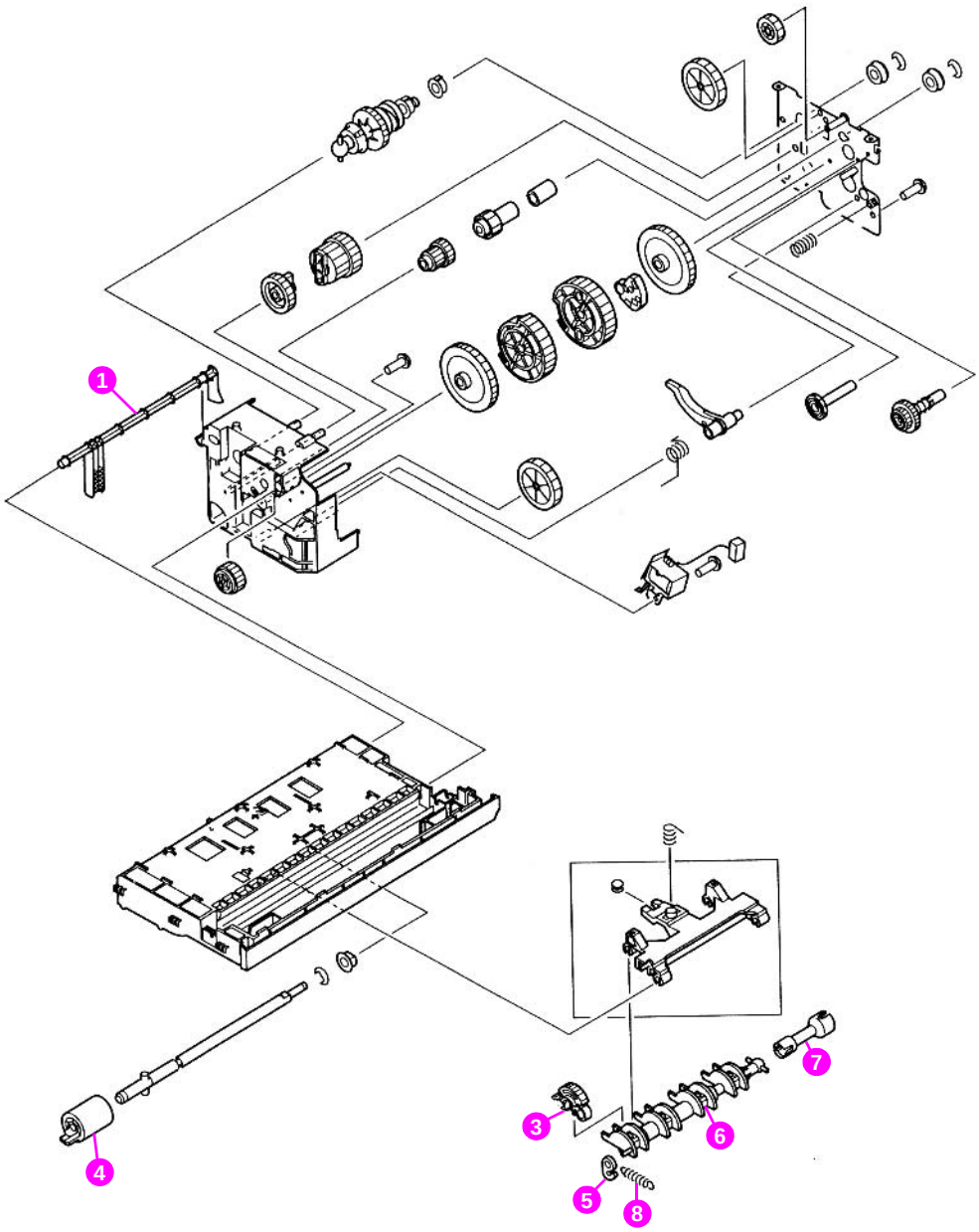

Figure 136. **Paper pickup guide assembly of optional 500-sheet feeder**

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Table 71. Paper pickup guide assembly, optional 500-sheet feeder

Item no.	Part no.	Quantity	Description
	RG5-5293-000CN	1	Paper pickup guide assembly, optionl 500-sheet feeder
1	RB1-8879-000CN	1	Arm, tray sensing
3	RB1-8957-000CN	4	Roller, pickup
4	RF5-3114-000CN	1	Feed, roller
5	RB1-2190-000CN	1	Clip, pickup spring
6	RB1-8867-000CN	1	Shaft, roller
7	RB1-8877-000CN	1	Coupler, pickup
8	RS5-2632-000CN	1	Spring, tension

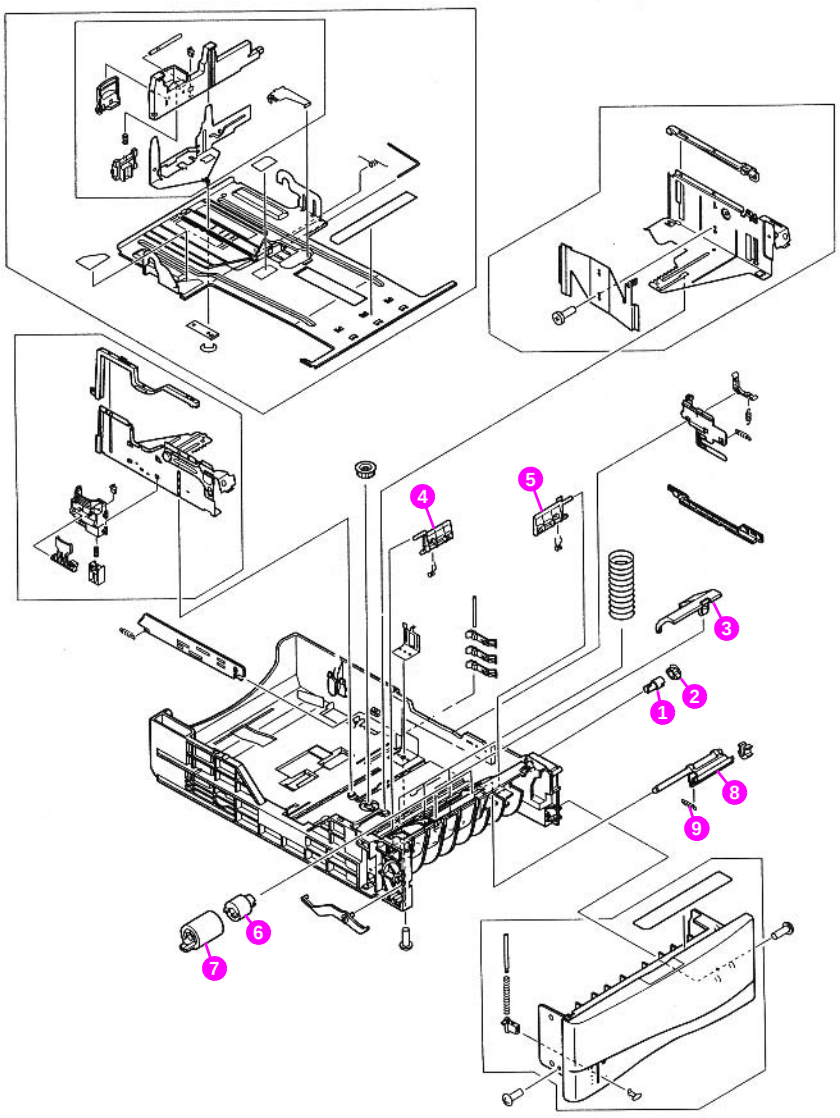

Figure 137. **500-sheet tray**

Table 72. 500-sheet tray

Item no.	Part no.	Quantity	Description
1	RB1-8945-000CN	1	Coupler, separation roller
2	RB1-8946-000CN	1	Bushing, separation roller
3	RB1-8947-000CN	1	Panel, roller access
4	RB1-8961-000CN	1	Left arm lifter
5	RB1-8962-000CN	1	Right arm lifter
6	RB1-8974-000CN	1	Torque limiter
7	RF5-3114-000CN	1	Roller, feed
8	RF5-2489-000CN	1	Mounting assembly separation roller
9	RS5-2622-020CN	1	Spring, separation roller tension

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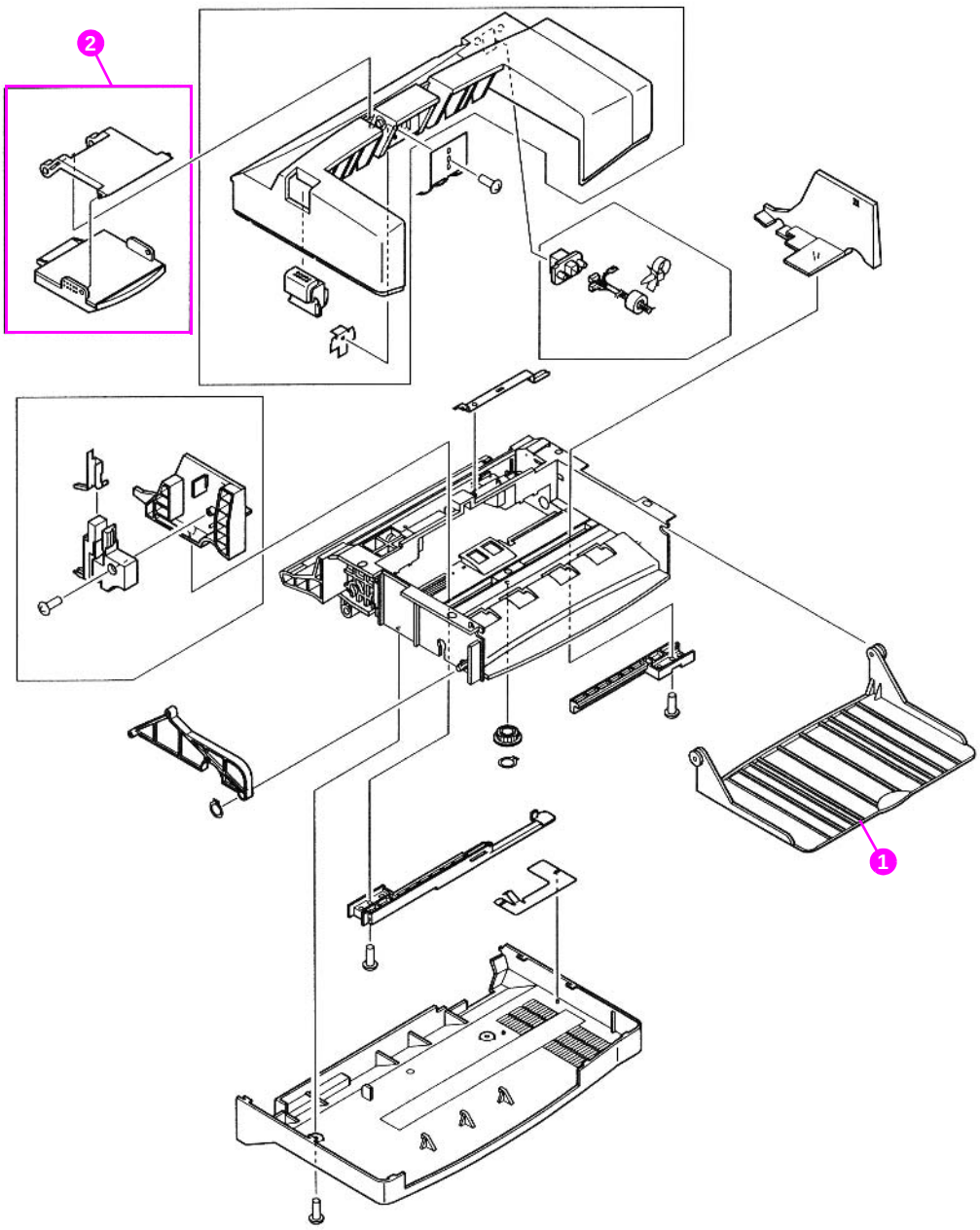

Figure 138. **Envelope feeder**

Table 73. Envelope feeder

Item no.	Part no.	Exchange no.	Quantity	Description
	C8053A	C8053-69001	1	Envelope feeder
1	RB2-4734-000CN		1	Tray, envelope feeder
2	RG5-2734-000CN		1	Weight assembly

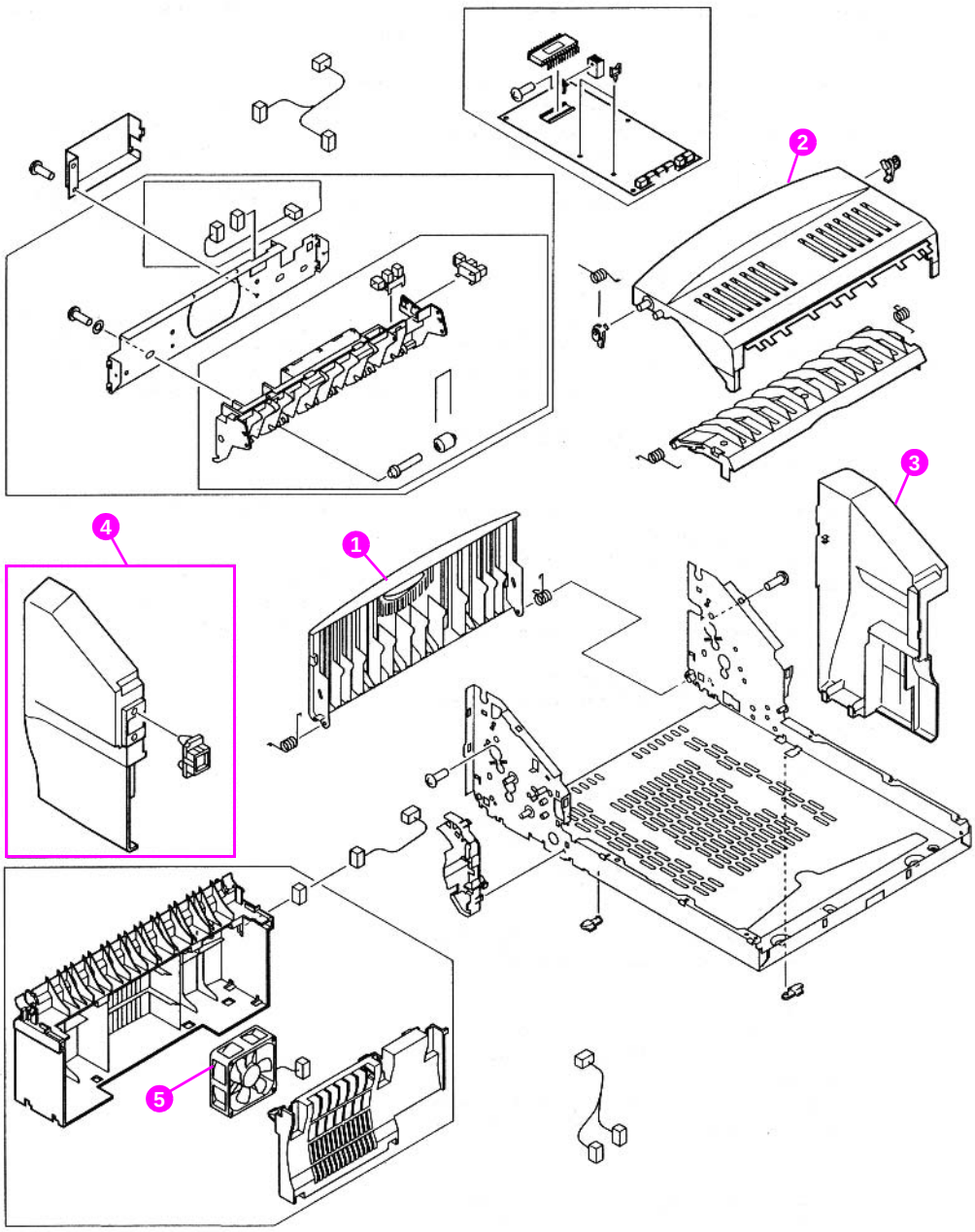

Figure 139. **Internal components of duplexer**

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Table 74. Internal components of duplexer

Item no.	Part no.	Exchange no.	Quantity	Description
	C8054A	C8054-69001	1	Duplexer
1	RB1-9045-000CN		1	Panel, rear
2	RB2-4766-000CN		1	Cover, top
3	RB2-4768-000CN		1	Cover, right
4	RF5-3092-000CN		1	Cover, left
5	RH7-1443-000CN		1	Fan

Alphabetical parts list

Table 75. Alphabetical parts list

Description	Part number	Table number and page
500-sheet paper feeder and tray	C8055A	Table 52 on page 271
AC, power receptacle (110 V) AC, power receptacle (220 V)	RG5-5111-000CN RG5-5280-000CN	Table 58 on page 281
Antenna assembly	RG5-5273-000CN	Table 60 on page 285
Antenna cable	RG5-5471-000CN	Table 60 on page 285
Arm, output kicker, left	RB2-4948-000CN	Table 68 on page 295
Arm, output kicker, right	RB2-4949-000CN	Table 68 on page 295
Arm, tray 1 paper sensing	RB1-8787-050CN	Table 66 on page 293
Arm, tray 1 retaining	RB2-2387-000CN	Table 66 on page 293
Arm, tray sensing	RB1-8879-000CN	Table 65 on page 291 Table 71 on page 301
Bushing, separation roller	RB1-8946-000CN	Table 72 on page 302
Cable and power receptacle 110 V 220 V	 RG5-5111-000CN RG5-5280-000CN	Table 54 on page 273
Cable holder, formatter	RB2-4992-000CN	Table 59 on page 283
Cable, antenna	RG5-5471-000CN	Table 54 on page 273 Table 60 on page 285
Cable, assembly, formatter	RG5-5351-000CN	Table 54 on page 273 Table 58 on page 281
Cable, duplexer	RG5-5358-000CN	Table 54 on page 273 Table 60 on page 285
Cable, envelope feeder connect	RG5-5344-000CN	Table 54 on page 273 Table 58 on page 281
Cable, feed/registration sensors	RG5-5357-000CN	Table 54 on page 273 Table 59 on page 283
Cable, laser	RG5-5350-000CN	Table 54 on page 273 Table 59 on page 283
Cable, laser scanner	RG5-5348-000CN	Table 54 on page 273
Cable, main motor	RG5-5346-000CN	Table 54 on page 273 Table 58 on page 281
Cable, memory	RG5-5470-000CN	Table 54 on page 273 Table 59 on page 283
Cable, output bin sensor	RG5-5349-000CN	Table 54 on page 273
Cable, paper feed/tray 1 pickup solenoid	RG5-5343-000CN	Table 54 on page 273 Table 58 on page 281
Cable, paper feeder	RG5-3822-000CN	Table 54 on page 273 Table 70 on page 299
Cable, paper feeder sensor	RG5-3711-000CN	Table 54 on page 273 Table 61 on page 287

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Table 75. Alphabetical parts list (continued)

Description	Part number	Table number and page
Cable, paper feeder w/ connector	RG5-3712-000CN	Table 54 on page 273 Table 61 on page 287
Cable, scanner	RG5-5348-000CN	Table 54 on page 273 Table 59 on page 283
Cable, top cover switch	RG5-5345-000CN	Table 54 on page 273 Table 58 on page 281
Cable, tray 1 sensor	RG5-5341-000CN	Table 54 on page 273 Table 58 on page 281
Clip, fan	RB2-4986-000CN	Table 58 on page 281
Clip, pickup spring	RB1-2190-000CN	Table 65 on page 291 Table 71 on page 301
Clip, right side panel	RB1-8860-000CN	Table 56 on page 277
Control panel, assembly	RG5-5372-040CN	Table 59 on page 283
Coupler, pickup	RB1-8877-000CN	Table 71 on page 301
Coupler, separation roller	RB1-8945-000CN	Table 72 on page 302
Cover assembly, left	RG5-5098-000CN	Table 56 on page 277
Cover assembly, right front	RG5-2664-020CN	Table 56 on page 277
Cover, envelope feeder	RB2-5037-000CN	Table 66 on page 293
Cover, grip, left	RB1-8924-000CN	Table 70 on page 299
Cover, grip, right	RB1-9385-000CN	Table 70 on page 299
Cover, left	RF5-3092-000CN	Table 74 on page 305
Cover, right	RB2-4768-000CN	Table 74 on page 305
Cover, top	RB2-4766-000CN	Table 74 on page 305
Cover, tray	RB2-4836-000CN	Table 70 on page 299
Cover, tray 1 sensor arm	RB2-5040-000CN	Table 66 on page 293
Cover, tray 2	RB2-4827-000CN	Table 56 on page 277
Delivery assembly	RG5-5094-000CN	Table 58 on page 281 Table 68 on page 295
Delivery drive assembly	RG5-5095-000CN	Table 55 on page 276 Table 63 on page 289
Delivery sensor arm assembly	RG5-5093-000CN	Table 68 on page 295
Duplexer	C8054A	Table 52 on page 271 Table 74 on page 305
EIO cover	5021-0349	Table 55 on page 276
EIO hard disk	J6054A	Table 52 on page 271
Engine controller board (110 V) Engine controller board (220 V)	RG5-5361-000CN RG5-5362-000CN	Table 55 on page 276 Table 58 on page 281 Table 62 on page 288
Engine controller board (110 V) Engine controller board (220 V)	C8049-69003 C8049-69004	Table 59 on page 283 Table 60 on page 285

Table 75. Alphabetical parts list (continued)

Description	Part number	Table number and page
Enhanced I/O Cards Token Ring networks Fast Ethernet (10/100Base-TX single RJ-45 port) HP JetDirect Connectivity card (EIO) for USB, Serial, LocalTalk	 J4167A J4169A J4135A	Table 52 on page 271
Envelope feeder	C8053A	Table 52 on page 271 Table 73 on page 303
Fan	RH7-1443-000CN	Table 74 on page 305
Fan, main cooling	RH7-1442-000CN	Table 59 on page 283
Feed, roller	RF5-3114-000CN	Table 71 on page 301
FIR receiver	C4103A	Table 52 on page 271
Firmware DIMM kit	C4168-67901	Table 55 on page 276
Flag, sensor	RB2-5034-000CN	Table 67 on page 294
Flash DIMM 2 MB 4 MB	 C4286A C4287A	Table 52 on page 271
Font DIMM (8 MB Asian MROM) Traditional Chinese Simplified Chinese Korean	 C4292A C4293A D4838A	Table 52 on page 271
Formatter	C4169-67901	Table 55 on page 276
Front inner cover assembly	RG5-5274-000CN	Table 58 on page 281
Fuse, 110 V, Engine Fuse, 220 V, Engine	VD7-0256-001CN VD7-0643-151CN	Table 62 on page 288
Fuse, 220 V, Engine Board Fuse, 110 V, Engine Board	RH3-8006-000CN WD1-0268-000CN	Table 62 on page 288
Fuser (110 V) Fuser (220 V)	RG5-5063-000CN RG5-5064-000CN	Table 55 on page 276 Table 69 on page 296
Fuser film assembly (110 V) Fuser film assembly (220 V)	RG5-5068-000CN RG5-5069-000CN	Table 69 on page 296
Fusing assembly (110 V) Fusing assembly (220 V)	C8049-69001 C8049-69002	Table 58 on page 281
Gear cover	RB2-5019-000CN	Table 66 on page 293
Guide, bottom cable	RB1-8704-030CN	Table 58 on page 281
Guide, paper	RB1-8914-000CN	Table 70 on page 299
HP LaserJet paper	HPJ1124	Table 52 on page 271
HP multi-purpose paper	HPM1120	Table 52 on page 271
Insulation, engine controller board	RB2-4975-000CN	Table 60 on page 285
Joint	RB1-8877-000CN	Table 65 on page 291
Laser cable	RG5-5350-000CN	Table 59 on page 283

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Table 75. Alphabetical parts list (continued)

Description	Part number	Table number and page
Laser scanner assembly	RG5-5100-000CN	Table 55 on page 276 Table 59 on page 283
Laser shutter arm	RB1-8700-000CN	Table 59 on page 283
Latch, rear tray	RB1-8846-000CN	Table 57 on page 279
Left arm lifter	RB1-8961-000CN	Table 72 on page 302
Left frame assembly, optional 500-sheet feeder	RG5-5292-000CN	Table 70 on page 299
Left frame assembly, tray 2	RG5-2669-000CN	Table 61 on page 287
Lever	RB2-2412-000CN	Table 70 on page 299
Lever, release	RB2-3497-000CN	Table 70 on page 299
Lower frame assembly	RG5-5271-000CN	Table 61 on page 287 Table 70 on page 299
Lower transfer roller guide	RB2-5043-000CN	Table 60 on page 285
Macintosh computer serial cable	92215S	Table 52 on page 271
Macintosh network cable kit	92215N	Table 52 on page 271
Main motor assembly	RH7-1440-000CN	Table 58 on page 281
Maintenance kit 110 V 220 V	 C8057A C8058A	Table 52 on page 271
Cartridge memory antenna assembly	RG5-5276-000CN	Table 60 on page 285
Cartridge memory antenna bracket	RB2-5008-000CN	Table 60 on page 285
Mount, thermistor	RB2-4996-000CN	Table 60 on page 285
Mounting assembly separation roller	RF5-2489-000CN	Table 72 on page 302
MP idler assembly	RG5-3723-000CN	Table 60 on page 285
Pad, separation	RF5-3086-000CN	Table 66 on page 293
Panel, formatter cover	RB1-8858-000CN	Table 56 on page 277
Panel, rear	RB1-9045-000CN	Table 74 on page 305
Panel, roller access	RB1-8947-000CN	Table 72 on page 302
Panel, toner cartridge access	RB1-8841-000CN	Table 57 on page 279
Paper delivery	RG5-5094-000CN	Table 55 on page 276
Paper feed	RG5-5086-000CN	Table 55 on page 276
Paper feed guide assembly	RG5-5083-000CN	Table 60 on page 285 Table 67 on page 294
Paper feed guide	RG5-5086-000CN	Table 55 on page 276
Paper feeder cable	RG5-3712-000CN	Table 70 on page 299
Paper feeder cable	RG5-3822-000CN	Table 70 on page 299
Paper feeder PCA, optional 500-sheet feeder	RG5-5539-000CN	Table 70 on page 299

Table 75. Alphabetical parts list (continued)

Description	Part number	Table number and page
Paper pickup guide assembly, optionl 500-sheet feeder	RG5-5293-000CN	Table 71 on page 301
Paper pickup guide assembly, tray 2	RG5-5277-000CN	Table 65 on page 291
Paper sensor cable	RG5-3711-000CN	Table 70 on page 299
Paper-size detection PCB assembly, tray 2	RG5-2673-004CN	Table 61 on page 287
Parallel cables 2-meter IEEE-1284 cable 3-meter IEEE-1284 cable	 C2950A C2951A	Table 52 on page 271
PCB, memory controller	RG5-5468-000CN	Table 60 on page 285
Photo-sensor	WG8-5362-000CN	Table 61 on page 287 Table 63 on page 289 Table 67 on page 294 Table 70 on page 299 Table 74 on page 305
Pickup drive assembly	RG5-5298-000CN	Table 70 on page 299
Pickup roller	RB1-8957-000CN	Table 65 on page 291 Table 71 on page 301
Plate, continuity	RB2-5002-000CN	Table 60 on page 285
Plate, grounding	RB1-9397-000CN	Table 70 on page 299
Plate, registration ground	RB2-4969-000CN	Table 60 on page 285
Power switch activator	RB1-8851-000CN	Table 58 on page 281
Power switch button	RB1-8849-000CN	Table 56 on page 277
Printer drive assembly	RG5-5087-000CN	Table 58 on page 281 Table 64 on page 290
Registration	RG5-5085-000CN	Table 55 on page 276
Registration assembly	RG5-5085-000CN	Table 60 on page 285
Registration/feed sensor assembly	RG5-5275-000CN	Table 59 on page 283
Right arm lifter	RB1-8962-000CN	Table 72 on page 302
Right frame assembly, optional 500-sheet feeder	RG5-5291-000CN	Table 70 on page 299
Right frame assembly, tray 2	RG5-5278-000CN	Table 61 on page 287
Rod, toner drive, included in assembly	RB1-8756-000CN	Table 64 on page 290
Roller, feed	RF5-3114-000CN	Table 61 on page 287 Table 72 on page 302
Roller, pressure	RB2-4919-000CN	Table 69 on page 296
Screw, M3x6, washer head, engine controller board	XA9-1016-000CN	Table 53 on page 272 Table 60 on page 285
Screw, M4x10	FA9-2753-000CN	Table 70 on page 299

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Table 75. Alphabetical parts list (continued)

Description	Part number	Table number and page
Screw, M4x10, self-tapping	XA9-0870-000CN	Table 53 on page 272 Table 61 on page 287
Screw, M4x10, self-tapping	XA9-0606-000CN	Table 53 on page 272
Screw, M4x10, self-tapping, feeder assembly	FA9-2753-000CN	Table 53 on page 272
Screw, M4x12, self-tapping, pan head	XB4-7401-207CN	Table 53 on page 272
Screw, M4x8.3, long, module	RB2-5013-000CN	Table 53 on page 272 Table 58 on page 281
Screw, stepped, M4, formatter	XA9-1143-000CN	Table 53 on page 272 Table 59 on page 283
Screw, tapping, pan head, M4x12	XB4-7401-207CN	Table 58 on page 281 Table 59 on page 283 Table 60 on page 285
Screw, tapping, truss head, M3x10	XB4-7301-006CN	Table 71 on page 301
Screw, TP, M3x8, main motor	XB6-7300-807CN	Table 53 on page 272 Table 58 on page 281
Screw, truss head w/washer, machine, grounding	FA9-1449-000CN	Table 53 on page 272 Table 58 on page 281 Table 60 on page 285
SDRAM DIMM 4 MB 8 MB 16 MB 32 MB 64 MB 128 MB	 C4140A C4141A C4142A C4143A C3913A C9121A	Table 52 on page 271
Sensor, optical, included in assembly	WG8-5362-000CN	Table 63 on page 289 Table 67 on page 294
Shaft, roller	RB1-8867-000CN	Table 65 on page 291 Table 71 on page 301
Shutter	RB1-8699-000CN	Table 59 on page 283
Solenoid, tray 1 drive	RH7-5172-000CN	Table 66 on page 293
Spring, leaf	RB2-4837-000CN	Table 61 on page 287
Spring, cartridge memory assembly	RB2-5009-000CN	Table 60 on page 285
Spring, rear tray latch	RB1-8847-000CN	Table 57 on page 279
Spring, separation roller tension	RS5-2622-020CN	Table 72 on page 302
Spring, shutter	RB1-8702-000CN	Table 59 on page 283
Spring, tension	RS5-2632-000CN	Table 65 on page 291 Table 71 on page 301
Spring, tension	RS5-2658-000CN	Table 70 on page 299
Spring, toner cartridge ground	RB2-4997-000CN	Table 60 on page 285

Table 75. Alphabetical parts list (continued)

Description	Part number	Table number and page
Spring, torsion	RB2-5035-000CN	Table 67 on page 294
Spring, tray	RB2-4122-000CN	Table 58 on page 281
Standard 500-sheet tray (without the feeder)	C8056A	Table 52 on page 271
Support, top cover, left	RB2-5003-000CN	Table 59 on page 283
Switch, top cover interlock access	WC4-5139-000CN	Table 58 on page 281
Thermistor, environmental	RH7-7116-000CN	Table 60 on page 285
Toner cartridge (10,000 pages)	C8061X	Table 52 on page 271
Toner cartridge (6,000 pages)	C8061A	Table 52 on page 271
Top cover assembly	RG5-2663-080CN	Table 55 on page 276 Table 57 on page 279
Torque limiter	RB1-8974-000CN	Table 72 on page 302
Transfer roller assembly	RG5-5295-000CN	Table 60 on page 285
Tray 1 assembly	RG5-2656-080CN	Table 55 on page 276 Table 58 on page 281
Tray 1 door assembly	RG5-2667-070CN	Table 56 on page 277
Tray 1 pickup assembly	RG5-5084-000CN	Table 55 on page 276 Table 58 on page 281 Table 66 on page 293
Tray 1 pickup roller assembly	RG5-3718-000CN	Table 66 on page 293
Tray assembly, rear	RG5-5097-000CN	Table 56 on page 277
Tray, envelope feeder	RB2-4734-000CN	Table 73 on page 303
Upper frame assembly, optional 500-sheet feeder	RG5-2689-000CN	Table 70 on page 299
Upper frame assembly, tray 2	RG5-5072-000CN	Table 61 on page 287
Weight assembly	RG5-2734-000CN	Table 73 on page 303

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Numerical parts list

Table 76. Numerical parts list

Part number	Description	Table number and page
5021-0349	EIO cover	Table 55 on page 276
92215N	Macintosh network cable kit	Table 52 on page 271
92215S	Macintosh computer serial cable	Table 52 on page 271
C2950A C2951A	Parallel cables 2-meter IEEE-1284 cable 3-meter IEEE-1284 cable	Table 52 on page 271
J6054A	EIO hard disk	Table 52 on page 271
C4103A	FIR receiver	Table 52 on page 271
C4140A C4141A C4142A C4143A C3913A C9121A	SDRAM DIMM 4 MB 8 MB 16 MB 32 MB 64 MB 128 MB	Table 52 on page 271
C4168-67901	Firmware DIMM kit	Table 55 on page 276
C4169-67901	Formatter	Table 55 on page 276
C4286A C4287A	Flash DIMM 2 MB 4 MB	Table 52 on page 271
C4292A C4293A D4838A	Font DIMM (8 MB Asian MROM) Traditional Chinese Simplified Chinese Korean	Table 52 on page 271
C8049-69003 C8049-69004	Engine controller board (110 V) Engine controller board (220 V)	Table 58 on page 281 Table 59 on page 283 Table 60 on page 285
C8053A	Envelope feeder	Table 52 on page 271 Table 73 on page 303
C8054A	Duplexer	Table 52 on page 271 Table 74 on page 305
C8055A	500-sheet paper feeder and tray	Table 52 on page 271
C8056A	Standard 500-sheet tray (without the feeder)	Table 52 on page 271
C8057A C8058A	Maintenance kit 110 V 220 V	Table 52 on page 271
C8061A	Toner cartridge (6,000 pages)	Table 52 on page 271
C8061X	Toner cartridge (10,000 pages)	Table 52 on page 271
FA9-1449-000CN	Screw, truss head w/washer, machine, grounding	Table 53 on page 272 Table 58 on page 281 Table 60 on page 285

Table 76. Numerical parts list (continued)

Part number	Description	Table number and page
FA9-2753-000CN	Screw, M4x10, self-tapping, feeder assembly	Table 53 on page 272 Table 70 on page 299
HPJ1124	HP LaserJet paper	Table 52 on page 271
HPM1120	HP multi-purpose paper	Table 52 on page 271
J4167A J4169A J4135A	Enhanced I/O Cards Token Ring networks Fast Ethernet (10/100Base-TX single RJ-45 port) HP JetDirect Connectivity card (EIO) for USB, Serial, LocalTalk	Table 52 on page 271
RB1-2190-000CN	Clip, pickup spring	Table 65 on page 291 Table 71 on page 301
RB1-8699-000CN	Shutter	Table 59 on page 283
RB1-8700-000CN	Laser shutter arm	Table 59 on page 283
RB1-8702-000CN	Spring, shutter	Table 59 on page 283
RB1-8704-030CN	Guide, bottom cable	Table 58 on page 281
RB1-8756-000CN	Rod, toner drive, included in assembly	Table 64 on page 290
RB1-8787-050CN	Arm, tray 1 paper sensing	Table 66 on page 293
RB1-8841-000CN	Panel, toner cartridge access	Table 57 on page 279
RB1-8846-000CN	Latch, rear tray	Table 57 on page 279
RB1-8847-000CN	Spring, rear tray latch	Table 57 on page 279
RB1-8849-000CN	Power switch button	Table 56 on page 277
RB1-8851-000CN	Power switch activator	Table 58 on page 281
RB1-8858-000CN	Panel, formatter cover	Table 56 on page 277
RB1-8860-000CN	Clip, right side panel	Table 56 on page 277
RB1-8867-000CN	Shaft, roller	Table 65 on page 291 Table 71 on page 301
RB1-8877-000CN	Coupler, pickup/Joint	Table 65 on page 291 Table 71 on page 301
RB1-8879-000CN	Arm, tray sensing	Table 65 on page 291 Table 71 on page 301
RB1-8914-000CN	Guide, paper	Table 70 on page 299
RB1-8924-000CN	Cover, grip, left	Table 70 on page 299
RB1-8945-000CN	Coupler, separation roller	Table 72 on page 302
RB1-8946-000CN	Bushing, separation roller	Table 72 on page 302
RB1-8947-000CN	Panel, roller access	Table 72 on page 302
RB1-8957-000CN	Pickup roller	Table 65 on page 291 Table 71 on page 301
RB1-8961-000CN	Left arm lifter	Table 72 on page 302
RB1-8962-000CN	Right arm lifter	Table 72 on page 302

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Table 76. Numerical parts list (continued)

Part number	Description	Table number and page
RB1-8974-000CN	Torque limiter	Table 72 on page 302
RB1-9045-000CN	Panel, rear	Table 74 on page 305
RB1-9385-000CN	Cover, grip, right	Table 70 on page 299
RB1-9397-000CN	Plate, grounding	Table 70 on page 299
RB2-2387-000CN	Arm, tray 1 retaining	Table 66 on page 293
RB2-2412-000CN	Lever	Table 70 on page 299
RB2-3497-000CN	Lever, release	Table 70 on page 299
RB2-4122-000CN	Spring, tray	Table 58 on page 281
RB2-4734-000CN	Tray, envelope feeder	Table 73 on page 303
RB2-4766-000CN	Cover, top	Table 74 on page 305
RB2-4768-000CN	Cover, right	Table 74 on page 305
RB2-4827-000CN	Cover, tray 2	Table 56 on page 277
RB2-4836-000CN	Cover, tray	Table 70 on page 299
RB2-4837-000CN	Spring, leaf	Table 61 on page 287
RB2-4919-000CN	Roller, pressure	Table 69 on page 296
RB2-4948-000CN	Arm, output kicker, left	Table 68 on page 295
RB2-4949-000CN	Arm, output kicker, right	Table 68 on page 295
RB2-4969-000CN	Plate, registration ground	Table 60 on page 285
RB2-4975-000CN	Insulation, engine controller board	Table 60 on page 285
RB2-4986-000CN	Clip, fan	Table 58 on page 281
RB2-4992-000CN	Cable holder, formatter	Table 59 on page 283
RB2-4996-000CN	Mount, thermistor	Table 60 on page 285
RB2-4997-000CN	Spring, toner cartridge ground	Table 60 on page 285
RB2-5002-000CN	Plate, continuity	Table 60 on page 285
RB2-5003-000CN	Support, top cover, left	Table 59 on page 283
RB2-5008-000CN	Cartridge memory antenna bracket	Table 60 on page 285
RB2-5009-000CN	Spring, cartridge memory assembly	Table 60 on page 285
RB2-5013-000CN	Screw, M4x8.3, long, module	Table 53 on page 272 Table 58 on page 281
RB2-5019-000CN	Gear cover	Table 66 on page 293
RB2-5034-000CN	Flag, sensor	Table 67 on page 294
RB2-5035-000CN	Spring, torsion	Table 67 on page 294
RB2-5037-000CN	Cover, envelope feeder	Table 66 on page 293
RB2-5040-000CN	Cover, tray 1 sensor arm	Table 66 on page 293
RB2-5043-000CN	Lower transfer roller guide	Table 60 on page 285

Table 76. Numerical parts list (continued)

Part number	Description	Table number and page
RF5-2489-000CN	Mounting assembly separation roller	Table 72 on page 302
RF5-3086-000CN	Pad, separation	Table 66 on page 293
RF5-3092-000CN	Cover, left	Table 74 on page 305
RF5-3114-000CN	Roller, feed	Table 61 on page 287 Table 71 on page 301 Table 72 on page 302
RG5-2656-080CN	Tray 1 assembly	Table 55 on page 276 Table 58 on page 281
RG5-2663-080CN	Top cover assembly	Table 55 on page 276 Table 57 on page 279
RG5-2664-020CN	Cover assembly, right front	Table 56 on page 277
RG5-2667-070CN	Tray 1 door assembly	Table 56 on page 277
RG5-2669-000CN	Left frame assembly, tray 2	Table 61 on page 287
RG5-2673-004CN	Paper-size detection PCB assembly, tray 2	Table 61 on page 287
RG5-2689-000CN	Upper frame assembly, optional 500-sheet feeder	Table 70 on page 299
RG5-2734-000CN	Weight assembly	Table 73 on page 303
RG5-3711-000CN	Cable, paper feeder sensor	Table 54 on page 273 Table 61 on page 287 Table 70 on page 299
RG5-3712-000CN	Cable, paper feeder w/ connector	Table 54 on page 273 Table 61 on page 287 Table 70 on page 299
RG5-3718-000CN	Tray 1 pickup roller assembly	Table 66 on page 293
RG5-3723-000CN	MP idler assembly	Table 60 on page 285
RG5-3822-000CN	Cable, paper feeder	Table 54 on page 273 Table 70 on page 299
RG5-5063-000CN RG5-5064-000CN	Fuser (110 V) Fuser (220 V)	Table 55 on page 276 Table 69 on page 296
RG5-5068-000CN RG5-5069-000CN	Fuser film assembly (110 V) Fuser film assembly (220 V)	Table 69 on page 296
RG5-5072-000CN	Upper frame assembly, tray 2	Table 61 on page 287
RG5-5084-000CN	Tray 1 pickup assembly	Table 55 on page 276 Table 58 on page 281 Table 66 on page 293
RG5-5085-000CN	Registration assembly	Table 55 on page 276 Table 60 on page 285
RG5-5086-000CN	Paper feed assembly	Table 55 on page 276 Table 60 on page 285 Table 67 on page 294
RG5-5087-000CN	Printer drive assembly	Table 58 on page 281 Table 64 on page 290

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Table 76. Numerical parts list (continued)

Part number	Description	Table number and page
RG5-5093-000CN	Delivery sensor arm assembly	Table 68 on page 295
RG5-5094-000CN	Delivery assembly, paper	Table 55 on page 276 Table 58 on page 281 Table 68 on page 295
RG5-5095-000CN	Delivery drive assembly	Table 55 on page 276 Table 63 on page 289
RG5-5097-000CN	Tray assembly, rear	Table 56 on page 277
RG5-5098-000CN	Cover assembly, left	Table 56 on page 277
RG5-5100-000CN	Laser scanner assembly	Table 55 on page 276 Table 59 on page 283
RG5-5111-000CN RG5-5280-000CN	AC, power receptacle (110 V) AC, power receptacle (220 V)	Table 54 on page 273 Table 58 on page 281
RG5-5271-000CN	Lower frame assembly	Table 61 on page 287 Table 70 on page 299
RG5-5273-000CN	Antenna assembly	Table 60 on page 285
RG5-5274-000CN	Front inner cover assembly	Table 58 on page 281
RG5-5275-000CN	Registration/feed sensor assembly	Table 59 on page 283
RG5-5276-000CN	Cartridge memory antenna assembly	Table 60 on page 285
RG5-5277-000CN	Paper pickup guide assembly, tray 2	Table 65 on page 291
RG5-5278-000CN	Right frame assembly, tray 2	Table 61 on page 287
RG5-5291-000CN	Right frame assembly, optional 500-sheet feeder	Table 70 on page 299
RG5-5292-000CN	Left frame assembly, optional 500-sheet feeder	Table 70 on page 299
RG5-5293-000CN	Paper pickup guide assembly, optionl 500-sheet feeder	Table 71 on page 301
RG5-5295-000CN	Transfer roller assembly	Table 60 on page 285
RG5-5341-000CN	Cable, tray 1 sensor	Table 54 on page 273 Table 58 on page 281
RG5-5344-000CN	Cable, envelope feeder connect	Table 54 on page 273 Table 58 on page 281
RG5-5345-000CN	Cable, top cover switch	Table 54 on page 273 Table 58 on page 281
RG5-5346-000CN	Cable, main motor	Table 54 on page 273 Table 58 on page 281
RG5-5348-000CN	Cable, scanner	Table 54 on page 273 Table 59 on page 283
RG5-5349-000CN	Cable, output bin sensor	Table 54 on page 273 Table 59 on page 283
RG5-5350-000CN	Cable, laser	Table 54 on page 273 Table 59 on page 283

Table 76. Numerical parts list (continued)

Part number	Description	Table number and page
RG5-5351-000CN	Cable, assembly, formatter	Table 54 on page 273 Table 58 on page 281
RG5-5357-000CN	Cable, feed/registration sensors	Table 54 on page 273 Table 59 on page 283
RG5-5358-000CN	Cable, duplexer	Table 54 on page 273 Table 60 on page 285
RG5-5361-000CN RG5-5362-000CN	Engine controller board (110 V) Engine controller board (220 V)	Table 55 on page 276 Table 58 on page 281 Table 62 on page 288
RG5-5372-040CN	Control panel, assembly	Table 59 on page 283
RG5-5468-000CN	PCB, memory controller	Table 60 on page 285
RG5-5470-000CN	Cable, memory	Table 54 on page 273 Table 59 on page 283
RG5-5471-000CN	Cable, antenna	Table 54 on page 273 Table 60 on page 285
RG5-5539-000CN	Paper feeder PCA, optional 500-sheet feeder	Table 70 on page 299
RH3-8006-000CN WD1-0268-000CN	Fuse, 220 V, Engine Board Fuse, 110 V, Engine Board	Table 62 on page 288
RH7-1440-000CN	Main motor assembly	Table 58 on page 281
RH7-1442-000CN	Fan, main cooling	Table 59 on page 283
RH7-1443-000CN	Fan	Table 74 on page 305
RH7-5172-000CN	Solenoid, tray 1 drive	Table 66 on page 293
RH7-7116-000CN	Thermistor, environmental	Table 60 on page 285
RS5-2622-020CN	Spring, separation roller tension	Table 72 on page 302
RS5-2632-000CN	Spring, tension	Table 65 on page 291 Table 71 on page 301
RS5-2658-000CN	Spring, tension	Table 70 on page 299
VD7-0256-001CN VD7-0643-151CN	Fuse, 110 V, Engine Fuse, 220 V, Engine	Table 62 on page 288
WC4-5139-000CN	Switch, top cover interlock access	Table 58 on page 281
WG8-5362-000CN	Photo-sensor	Table 61 on page 287 Table 63 on page 289 Table 67 on page 294 Table 70 on page 299 Table 74 on page 305
XA9-0606-000CN	Screw, M4x10, self-tapping	Table 53 on page 272
XA9-0870-000CN	Screw, M4x10, self-tapping	Table 53 on page 272 Table 61 on page 287
XA9-1016-000CN	Screw w/washer, M3x6, engine controller	Table 53 on page 272 Table 60 on page 285
XA9-1143-000CN	Screw, stepped, M4, formatter	Table 53 on page 272 Table 59 on page 283

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Table 76. Numerical parts list (continued)

Part number	Description	Table number and page
XB4-7401-207CN	Screw, M4x12, self-tapping, pan head	Table 53 on page 272
XB4-7401-207CN	Screw, tapping, pan head, M4x12	Table 58 on page 281 Table 59 on page 283 Table 60 on page 285
XB6-7300-807CN	Screw, TP, M3x8, main motor	Table 53 on page 272 Table 58 on page 281

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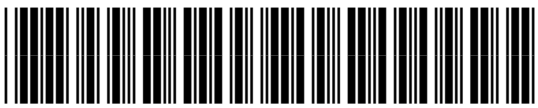

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